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THE INDUSTRIAL DEVELOPMENT OF CHILE

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EXPLANATORY NOTE

Resolution 250 (XI) of 14 May 1965, adopted by the Economic Commission for Latin America (ECLA) at its eleventh session, requested the Latin American Governments "to prepare national studies on the present status of their respective industrialization processes for presentation at the regional symposium". With a view to facilitating the task of the officials responsible for the national studies, the ECLA secretariat prepared a guide, which was also intended to ensure a certain amount of uniformity in the presentation of the studies with due regard for the specific conditions obtaining in each country.

Studies of the industrial development of fourteen countries were submitted to the Latin American Symposium on Industrial Development, held in Santiago, Chile, from 14 to 25 March 1966, under the joint sponsorship of ECLA and the Centre for Industrial Development, and the Symposium requested ECLA to ask the Latin American Governments "to revise, complete and bring up to date the papers presented to the Symposium".

The work of editing, revising and expanding the national monographs was completed by the end of 1966 and furthermore, two new studies were prepared. The ECLA secretariat attempted, as far as possible, to standardize the presentation of the reports, in order to permit comparison of the experience of the different countries with regard to specific problems, particularly in the field of industrial policy.

The national studies on industrial development, to be presented to the International Symposium relate, in alphabetical order, to the following countries: Argentina, Bolivia, Brazil, Central America, Chile, Colombia, Cuba, Ecuador, Guyana, Mexico, Panama, Paraguay, Peru, Trinidad and Tobago, Uruguay and Venezuela.

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/EXPLANATORY NOTE

INTRODUCTION

The General Assembly of the United Nations in its XVIII session authorized by Resolution No. 1940 the holding of an International Symposium on Industrial Development, to be preceded by Regional Symposia.

At the request of the Chilean Ministry of Foreign Affairs (Communication 18026 of December 15, 1965), the Development Corporation (CORFO) undertook to draw up the present report with the view of giving the most complete picture possible within the limited time available of the present situation and future development of chilean industry.

To this end, the following organizations were commissioned to prepare individual chapters or articles germane to their work: the Technical Assistance Service, the Central Bank of Chile, the Ministry of Finance, the Planning Office (ODEPLAN), the National Sugar Industry S.A. (IANSA), the Chilean Steel Institute, and the Executive Secretariat for the Latin-American Free Trade Area (ALALC). Their work was co-ordinated by CORFO, whose industrial department also prepared a large part of the document.

Owing to the above mentioned time limitations and the preparation procedures used, the present report could not be an exhaustive treatment of the subject and some of its chapters had to be particularly cursory. However, it contains all the background information needed for an overall view of chilean industry and its situation.

/Chapter I

Chapter I

HISTORICAL OUTLINE [1]

1. The impact of the crisis

The great international crisis of 1930 brought out the fragility of the Chilean economic structure, which overnight found itself in an extremely critical situation. The capacity to import fell sharply - from 100 in 1929 to 40 in 1931 [2] - and the major part of export activity was brought to a standstill, creating considerable unemployment, with resulting social problems. Moreover, Chile could no longer resort to the international capital market, as it had previously done with some regularity, since the Swiss, Switzerland and London markets had disappeared.

The crisis struck Chile with perhaps greater force than any other country. The impact was violent and the contraction of economic activity so great that the direction of development was diametrically changed. The country had no alternative but to direct its development "inwardly" by creating and stimulating forces strong enough partially to ameliorate the situation caused by the collapse of the export trade.

The two internal sectors that could take over the dynamic part until then played by the expanding external sector were agriculture and industry. The first, owing to factors which need not be analyzed here,[3] proved itself incapable of increasing its slow rhythm of development; the second, however, responded positively. Thus, the two sectors began to develop at an unequal pace, which was to create a dangerous structural imbalance and strong inflationary pressures.

The scarcity on the domestic market of manufactured articles formerly imported became a powerful stimulus to industry.

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[1] See, La Geografía Económica de Chile, 1965 (CORFO).

[2] The Economic Commission for Latin America, Economic Survey of Latin America, 1949.

[3] Factors of an institutional type, in particular relating to land tenure and rural social conditions.

/After 1932

After 1932 strict currency control and the displacement of a large contingent of workers at least partly trained from the shut-down mines into industry, many of whom set up their own enterprises, was another such stimulus.

Currency control gave priority to supplying industries with the double purpose of increasing supplies of goods and services, sharply reduced by the crisis, and lessening the unemployment in export activities.

Under these new conditions, efforts were concentrated on maximum use of production capacity in already existing manufacturing industry,[4] improvement of production techniques and the creation of numerous small workshops, equipped mostly with domestic tools and machinery.

In addition, certain large foreign and domestic commercial enterprises who found their supplies of foreign products cut off and their business declining, tried to counteract this by selling and distributing domestic products, and in some cases, associating themselves with domestic industrialists, or financing or creating their own industries. Other foreign enterprises, prevented by the currency regulations from sending their profits abroad, chose to invest them in Chilean manufacturing activities.[5]

On account of the adverse circumstances, particularly the shortage of capital and technical know-how, the industrialization of 1930-1940 was carried out at the cost of great sacrifices and was irregular and slow.[6]

The first efforts were concentrated on substitution of consumer goods. Four industrial sectors: wearing apparel and footwear, food, furniture and fixtures, and metal products, absorbed between 71 and 75 per cent of manufacturing employment, a clear indication of the predominance of artisan activity in the sector.

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[4] Oscar Alvarez, Historia del Desarrollo Industrial de Chile, Santiago, 1936; estimates that in 1932 industry operated at only 50 per cent of its installed capacity.

[5] The firm of Grace set up various industries in cloth, sugar, paint, electrical equipment, etc. SOGECO and COPEC, among the domestic firms, also began several industries, as did Duncan Fox, Williamson Balfour, and others.

[6] The average growth rate of industrial manpower between 1930 and 1940 was 2.7 per cent annually cumulative.

At this stage, development was based on private initiative working within an institutional framework created by the government to stimulate industrial activity through general policy measures: currency control, assistance in setting up industrial units, etc.

Thus, it will be seen that because of the world crisis obstacles which until then had hindered industrialization disappeared; and foreign trade having diminished social energies were re-directed towards industry. For the first time in Chilean history the mercantile sector contributed fully to industrialization.[7]

2. A conscious effort towards industrialization

Industrialization, besides effecting changes in Chilean society, created in turn conditions favourable to a process of conscious and organized action. This was furthered by the emergence on an international level of the new conception of economic planning as a means of halting the cyclical crises and upheavals which had so often troubled mankind. What might be called an "industrial conscience" is growing up in Chile.

In contrast to previous periods, since 1938 governments have made planned efforts toward industrialization.[8] They have not been content merely to provide the protectionist measures required, but have given the state an active role as the creator and financer of several basic industries.

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[7] See, Economic Survey of Latin America, 1949, ECLA, which states on p. 271 that "it is evident that such a policy is not the outcome of choice, nor does it imply any intention to dispense with the possibility of greater outward development. On the contrary, it is the very inadequacy of such possibilities that has compelled Chile to modify the structure of its economy, in order to pursue its economic growth."

[8] One of the principal platforms of the presidential candidate in 1938, Pedro Aguirre Cerda, was the need for industrialization in order to raise the Chilean standard of living. This thought was included in the law which created CORFO in 1939, CORFO being there commissioned to draw up a plan to increase production in order to raise the standard of living.

/A proof

A proof of this new attitude on the part of the government was the creation of the Development Corporation (CORFO) [9] in 1939, the first organization of its kind in Latin America, which since served as a model for similar organizations in other countries. CORFO truly marks an epoch in the history of Chile, since it has contributed decisively to economic development in general and that of industry in particular.

CORFO's creation of basic industries such as the Steel and Electric Power Industries was a decisive impulse to the establishment of new enterprises. Deliberate government intervention in industrialization added from 1939 on a new and powerful incentive: the need to supply various manufactured articles whose import the Second World War had cut off. This factor stimulated the substitution process, which, beginning with consumer goods, spread to intermediate products, and, in certain cases, capital goods.

The industrialization process found a new vigour at that time, and the bases of Chile's present industry were consolidated. The growth rate of manufacturing production reached the high average of 11 per cent annually in 1941-46.

3. Industry faces a new situation

Once the two great impulses to industrialization (the 1930 crisis and the Second World War) had exhausted themselves and import substitution had been completed in most headings a new period was entered. The annual growth rate fell from the 11 per cent of 1941-46 to an average of 1.8 per cent in 1946-51.

This was partly due, to the effort of the most important concerns to consolidate their positon in the market and partly to the improvement in the terms of trade effect,[10] which increased the amount of foreign exchange available for purchasing manufactured imports. Foreign exchange that had accumulated during the war was earmarked for renewing equipment and machinery and for the import of certain articles being manufactured in Chile.

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[9] Law No. 6334, passed April 29, 1939.

[10] Ingreso Interno. Cuentas Nacionales, CORFO.

/Meanwhile, the

Meanwhile, the appearance on the market of two great basic plants - the steel industry of Huachipato in 1950 and the Concon refinery in 1954 - and the further electrification of the country by ENDESA (National Electrification Company) created conditions favourable to new industrial expansion. The creation of Huachipato was important in this respect, as it stimulated the foundation of numerous metallurgic industries, mostly in the region of Concepción and in the central region.

These stimuli were reflected in the rise in the annual growth rate to 4.7 per cent during 1949-56.[11]

Moreover, in order to continue the process of growth, Chilean industrialists began to look towards foreign markets in the hope of being able to set up large-scale, heavily-capitalized units.

In 1955 further changes began to be made in the economic régime. The initiative, it must be emphasized, again came from abroad. Much direct government control and interference was replaced by indirect measures. At the same time, greater liberty was given to economic activities, competition was encouraged, and a definite anti-inflationary policy of the standard type, which emphasized demand, was initiated.[12]

The gross domestic product at market prices in 1962 and 1963 was only 18 per cent above 1957. The growth rate from 1957 to 1963 was only 2.8 per cent annually.

These changes in general economic policy have shown that manufacturing is going through what might be called a "growth crisis". Its future expansion depends on an increase in internal demand and on the export prospects of Chilean products in international markets, particularly those of Latin America.

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[11] Ingreso Interno, Cuentas Nacionales, CORFO.

[12] This policy was recommended by the International Monetary Fund and applied by a foreign Technical Mission which emphasized wage and salary freezes and credit restriction.

/Chapter II

Chapter II

THE ECONOMIC IMPORTANCE OF THE MANUFACTURING INDUSTRY AND ITS GENERAL CHARACTERISTICS

1. Industrial production

Since the great crisis of 1930, manufacturing industry has played a dynamic part in economic development. While the total economy's growth rate between 1940 and 1963 averaged 3.6 per cent annually, that of manufacturing industry was 3.9 per cent.

Manufacturing is the country's prime economic activity, as far as the gross domestic product is concerned. As will be seen in Table 1, it already represented 20 per cent of the gross domestic product between 1940 and 1944, and between 1955 and 1963 it was 24 per cent. It is interesting to note that only three other Latin American countries have exceeded this proportion: Argentina, Brazil and Mexico.[13]

However, if the development of industry is compared with that of the economy as a whole, it will be seen that in only two five-year periods, 1940-45 and 1950-55, was there a favourable growth ratio - 2.98 in the first and 1.45 in the second. In the period 1945-50 the ratio was 0.88, in 1955-60 it was 0.06 and in 1960-63, 0.37. The average ratio between 1940 and 1963 was 1.13. In other words: for every 1 per cent of growth by the economy as a whole industry grew by 1.13 per cent.

The favourable ratio of 1940-45, when industrial growth nearly tripled that of the total economy, was due, as stated in the previous chapter, to the strong impulse given by import substitution during the Second World War and the strong support given industry by the governments of President Pedro Aguirre Cerda and President Juan Antonio Ríos, mainly through CORFO.

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[13] ECLA - Algunas características del desarrollo industrial en el período 1950-60 (E/CN.12/602).

/Table 1

Table 1

CHILE: PRODUCTION STRUCTURE

(In percentages of the gross domestic product at constant market prices)

Economic sectors	1940-44	1945-49	1950-54	1955-59	1960-63
1. Primary activities	22.7	20.4	18.6	16.6	14.8
a) Agriculture	14.7	14.1	13.1	12.2	9.8
b) Fishing	0.3	0.2	0.2	0.3	0.3
c) Mining	7.7	6.1	5.3	4.2	4.6
2. Secondary activities	23.3	25.7	25.1	27.4	27.9
a) Industries	20.0	22.0	21.8	23.9	23.6
b) Construction	2.4	2.9	2.3	2.4	3.1
c) Electricity, gas and water	0.9	0.8	1.0	1.1	1.2
3. Tertiary activities	56.2	57.4	56.6	55.7	57.0
a) Commerce	18.2	18.9	18.8	19.4	18.9
b) Transport and communications	6.8	7.0	6.0	6.8	6.1
c) Financial services	4.0	3.5	3.7	3.4	3.6
d) Government services	6.0	6.7	8.4	8.8	9.1
e) Personal services	10.5	11.3	10.3	9.1	9.4
f) Ownership of dwellings	10.7	10.0	9.4	8.1	9.9
4. Terms of trade adjustment	2.0	3.5	0.3	0.3	0.3
Gross domestic product	100.0	100.0	100.0	100.0	100.0

Source: Cuentas Nacionales, 1964, CORFO.

If Chile's industrial growth/economic growth ratio of 1.13 is compared to that of other developing countries, it is apparent that Chilean industry has not taken full advantage of the expansion possibilities offered by the total economy. The ratio for a group of under-developed countries was 1.89,[14] much higher than Chile's.

In Table 1 changes in the production structure are apparent. While primary activities have lessened their participation through the years from 22.7 to 14.8 per cent, secondary activities have increased from 23.3 per cent to 27.9 per cent, while tertiary activities have not varied substantially.

The long-term decline of agriculture and mining is striking, and has not been compensated for by industrial activity. This has been a marked trend in the national economy for the past 30 years. It reflects the exhaustion of two basic sectors: agriculture and foreign trade (mining), a situation which has deteriorated dangerously in the last decade.

Other characteristics of Chilean industry, that show the kind of expansion it has undergone are: the large contribution to the product of the "traditional" industries, which mostly produce goods for current consumption; the incipient development of the metal-transforming industries which produce capital goods, and the large contribution of artisan and home industries.

These characteristics can be appreciated from table 2, which shows the composition of the value added of manufacturing industry by major groups.

It must be remembered that in the most industrialized countries of Latin America, such as Argentina and Brazil, the contribution of "traditional" industries is less than 40 per cent (in the United States, about 30 per cent). In Chile, according to table 2, this proportion is

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[14] Programming Techniques for Economic Development, with Special Reference to Asia and the Far East, United Nations 1960, 60.II F.3. The ratio was for ten ECAFE, 8 Latin American, 5 Southern European, 2 Middle Eastern and 2 African countries in the period 1950-1959.

/Table 2

Table 2

CHILE: VALUE ADDED OF MANUFACTURING INDUSTRY IN 1957

Major groups	Factory industry	Artisan industry	Manufacturing total	
	In millions of escudos, at 1957 prices			Percentages
A. **Traditional industries**	158	104	262	60.5
20. Foods	59	8	67	15.5
21. Beverages	9	2	11	2.5
22. Tobacco	3	-	3	0.7
23. Textiles	42	1	43	9.9
24. Wearing apparel and footwear	25	63	88	20.3
25. Wood and cork	12	10	22	5.1
26. Furniture and fixtures	4	19	23	5.3
29. Leather and hides	4	1	5	1.2
B. **Intermediate industries**	86	2	88	20.3
27. Pulp and paper	7	1	8	1.8
30. Rubber	4		4	0.9
31. Chemical products	23		23	5.3
32. [illegible]roleum derivatives	9	1	9	2.1
33. [illegible]n-metallic minerals	17		18	4.2
34. Basic metals	26		26	6.0
C. **Metal-transforming industries**	28	15	43	9.9
35. Metal products 36. Machinery 37. Electrical equipment 38. Transport material	28	15	43	9.9
D. **Others**	15	25	40	9.3
28. Printing, publishing and allied	12	5	17	4.0
39. Miscellaneous	3	20	23	5.3
Manufacturing industry	287	146	433	100.0
Percentages	66.3	33.7	100.0	-

Source: CORFO.

as high as 60.5 per cent.[15] In contrast, the metal-transforming industries contributed only 10 per cent of the industrial product. In Argentina and Brazil this proportion is more than 20 per cent. On the other hand, artisan and home industry generated more than a third of the Chilean industrial product.[16]

2. Working population

According to the last population census (1960), manufacturing industry employed 418,700 people in that year, or 18.1 per cent of the country's total working population. Only agriculture exceeded this number with 665,500 or 28.6 per cent.

Table 3 shows that the population occupied in manufacturing industry increased by 115,800 during 1940-1960, with an annual growth of 5,790 persons. However, the average annual growth was much higher during 1940-1952, (9,333 persons) than in 1952-1960 (473 persons).

These statistics show the inability of manufacturing industry, especially since 1952, to absorb any considerable part of the manpower which appears each year on the labour market.[17] This factor, united to the relative decline in primary industrial activities, has resulted in a monstrous growth of tertiary activites, where there is, in addition, under-employment or disguised employment.[18]

The increasing inadequasy of manufacturing industry to provide large-scale employment may be seen in greater clarity in table 4.

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[15] In 1957 three groups - food, textiles and wearing apparel - contributed 45.7 per cent of the industrial product.

[16] Three groups - wearing apparel and footwear, furniture and fixtures, and miscellaneous contributed 69.9 per cent of the artisan product.

[17] It is estimated that at present 120,000 persons annually reach the age of 15 years.

[18] The number of persons who must exist on a basis of sporadic or part-time work is large but not exactly known.

/Table 3

Table 3

CHILE: WORKING POPULATION BY ECONOMIC SECTORS

(In thousands of persons)

Economic activities	1940		1952		1960	
	Number	Percentage	Number	Percentage	Number	Percentage
1. Primary activities	749.6	43.1	761.0	36.1	786.8	33.8
a) Agriculture	645.5	37.1	649.7	30.8	665.5	28.6
b) Fishing	5.0	0.3	8.5	0.4	17.9	0.8
c) Mining	99.1	5.7	102.8	4.9	103.4	4.4
2. Secondary activities	373.7	21.5	539.5	25.6	614.7	26.5
a) Industries	302.9	17.4	414.9	19.7	418.7	18.1
b) Construction	60.2	3.5	103.9	4.9	172.0	7.4
c) Electricity, gas and water	10.6	0.6	20.7	1.0	24.0	1.0
3. Tertiary activities	617.0	35.4	802.2	38.3	923.0	39.7
a) Trade	162.2	9.3	198.1	9.4	202.0	8.7
b) Transport and communications	77.4	4.4	96.3	4.6	127.0	5.5
c) Financial services	14.2	0.8	27.8	1.3	32.0	1.4
d) Government services	94.9	5.5	102.0	4.8	119.0	5.1
e) Personal services	268.3	15.4	384.0	18.2	443.0	19.0
f) Ownership of dwellings	-	-	-	-	-	-
Total working population	1 740.3	100.0	2 108.7	100.0	2 324.5	100.0
Total population of the country	5 023.5	-	6 277.0	-	7 627.0	-

Source: Population Census. The industrial population for 1960 is according to an estimate of CORFO.

Table 4

CHILE: INDUSTRIAL POPULATION ACCORDING TO POPULATION CENSUSES

	1930	1940	1952	1960
Per 1 000 of the total population	48	53	66	55 a/
Per 1 000 of the working population	157	154	197	181

Source: Population censuses of the National Statistical Service.

a/ CORFO estimate.

Another characteristic of industrial employment has been its sharp trend toward geographical concentration. The increase in the population involved in manufacturing has not been uniform throughout the country, and to some extent has consisted only in a further build-up in particular areas (the central region, and Concepción), as can be seen in table 5. While more than 85 per cent of the working population is to be found in the centre of the country and in the provinces around the Bío-Bío basin, there has been a notable decrease in manufacturing employment in the Norte Chico, in the lake region, and in the far south. Moreover, the highest proportions of industrial employment in total employment occur in the central region, Concepción, and the Frontera.

An analysis of the occupational structure shows that artisan and home industry is of geat importance, as it employs 49.8 per cent of the total manpower. This confirms the elementary nature of Chile's industrial development. The traditional industries absorb 63.5 per cent of manufacturing employment;[19/] (see table 6).

[19/] Three groups: food, textiles, wearing apparel and footwear for 48.4 per cent.

/Table 5

Table 5

CHILE: GEOGRAPHICAL DISTRIBUTION OF INDUSTRIAL EMPLOYMENT

(In percentages)

Geographical regions	Total manufacturing industry			Total population		
	1940	1952	1960	1940	1952	1960
I. Norte Grande	3.7	2.8	3.7	10.8	10.3	12.6
II. Norte Chico	3.9	2.9	2.5	9.6	10.5	8.2
III. Central Region	68.5	70.6	71.8	17.7	22.4	20.2
IV. Concepción and La Frontera	14.9	15.0	14.3	12.2	16.3	13.7
V. Lake region	6.9	6.9	5.8	13.4	16.5	12.9
VI. Canal region	2.1	1.8	1.9	9.7	10.9	10.6
Entire country	100.0	100.0	100.0	17.4	19.7	18.1

Source: Population Censuses, National Statistical Service.

/Table 6

Table 6

CHILE: WORKING POPULATION IN MANUFACTURING INDUSTRY IN 1957

Major groups	Factory industry	Artisan industry	Manufacturing total	
	In thousands of persons		Thousands of persons	Per-cent
A. Traditional industries	127	137	264	63.5
20. Foods	37	12	49	11.8
21. Beverages	5	2	7	1.7
22. Tobacco	1	-	1	0.2
23. Textiles	38	1	39	9.4
24. Wearing apparel and footwear	27	86	113	27.2
25. Wood and cork	11	9	20	4.8
26. Furniture and fixtures	5	25	30	7.2
29. Leather and hides	3	2	5	1.2
B. Intermediate industries	42	4	46	11.0
27. Pulp and paper	3	1	4	1.0
30. Rubber	2	-	2	0.5
31. Chemicals products	12	1	13	3.1
32. Petroleum derivatives	1	-	1	0.2
33. Non-metallic minerals	12	1	13	3.1
34. Basic metals	12	1	13	3.1
C. Metal-transforming industries	28	31	59	14.2
35. Metal products 36. Mabhinery 37. Electrical equipment 38. Transport material	28	31	59	14.2
D. Others	12	35	47	11.3
28. Printing, publishing and allied	8	4	12	2.9
39. Miscellaneous	4	31	35	8.4
Manufacturing industry	209	207	416	100.0
Percentages	50.2	49.8	100.0	

Source: CORFO and Statistics and Census Bureau. The figures for factory workers are those of the Manufacturing Census of CORFO's Industrial Survey. Those for artisan industry are from a CORFO estimate for the same year.

/3. Industrial

3. Industrial capital

Another significant indicator of the development level of manufacturing industry is the amount of capital invested. However, it is very difficult to calculate the exact amount in Chile, because of the distorting effects of inflation and inadequate statistics.

For these reasons, the following figures, taken from the industrial survey made by CORFO in 1958 [20] must be viewed with reservation.

According to this survey, in 1957 manufacturing industry's fixed capital, including machinery, equipment, buildings and installations, was 518.7 million escudos, of which 86 per cent belonged to factory industry and 14 per cent to artisan industry.

Four groups - two traditional and two intermediate [21] possessed 54.5 per cent of the total industrial capital. The food, textile, and basic metal industries each had more than 15 per cent of the total capital (see table 7).

The average capital density per employee was 2.8 escudos in factory industry and 0.7 escudos or one-fourth in artisan industry.

4. Foreign trade

Chile's foreign trade in manufactured products continues at a high level, having reached more than 500 million dollars in 1963. This trade is chiefly limited to two areas: Western Europe and the United States. Trade with Latin America is on a small-scale, and only Japan is important among other countries. Trade with socialist countries continues at a low level. It must be noted that there is a strong imbalance in the trade in industrial products, to the detriment of Chile. While imports exceed 400 million dollars, the country's exports of manufactured products are only a little more than 30 million dollars annually, representing only 5 per cent of the country's total exports.

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[20] Its figures are for 1957.

[21] Food and textiles, non-metallic minerals and basic metals.

/Table 7

Table 7

CHILE: FIXED CAPITAL OF MANUFACTURING INDUSTRY IN 1957

(In millions of escudos of 1957)

Major groups	Factory industry	Artisan industry	Manufacturing total
A. Traditional industry	204.7	31.6	236.1
20. Food	72.0	4.4	76.4
21. Beverages	8.0	0.2	8.2
22. Tobacco	1.7	-	1.7
23. Textiles	82.7	0.5	83.2
24. Wearing apparel and footwear	18.2	23.8	42.0
25. Wood and cork	11.8	1.9	13.7
26. Furniture and fixtures	4.0	0.6	4.6
29. Leather and hides	6.3	0.2	6.5
B. Intermediate industries	179.1	1.7	180.8
27. Pulp and paper	5.7	-	5.7
30. Rubber	5.3	-	5.3
31. Chemical products	35.4	-	35.4
32. Petroleum derivatives	11.0	0.1	11.1
33. Non-metallic minerals	45.5	0.1	45.6
34. Basic metals	76.2	1.5	77.7
C. Metal-transforming industries	45.2	23.3	68.5
35. Metal products 36. Machinery 37. Electrical equipment 38. Transport material	45.2	23.3	68.5
D. Others	15.7	17.4	33.1
28. Printing, publishing and allied	9.1	0.3	9.4
39. Miscellaneous	6.6	17.1	23.7
Manufacturing industry	444.7	74.0	518.7
Percentages	85.7	14.3	100.0

Source: CORFO, Encuesta Industrial 1957.

(a) Imports

Although earlier chapters have shown that the Chilean industrialization process has been directed chiefly toward import substitution, the value of manufactured products acquired abroad continues to rise (see table 8).

This is due to a pronounced qualitative change in the composition of these imports. While the importation of goods for final consumption has dropped sharply, that of intermediate and capital goods has grown substantially. This structural change in imports marks an important step in the industrialization process.

Accordingly, the strong increase in imports of capital goods, chemical products and transport equipment must be noted. These groups offer prospects of substitution, particularly if the efforts towards the economic integration of Latin American are carried forward.

It is difficult to evaluate Chile's substitution effort in the industrial field. CORFO has prepared an estimate on very broad lines, which gives an idea of the scope of this effort.

This estimate[22] concludes that if the development level of 1925-29, with its internal production structure and types of imports, had continued, it would have been necessary to import about 800 million dollars more, during recent years, than was the case.

Although these figures are simplified, they are large enough to show clearly the extent to which industrialization has provided a more solid basis for the Chilean economy, although more could have been accomplished had the total resources of the country been more effectively used.

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[22] CORFO - Plan Decenal. The bases of the estimate are as follows: the total of available goods and services during 1925-29 was about 95 million escudos annually (at 1950 valuation), and imports were 30 million, or 30 per cent. The total of goods and services in 1945-56 has been estimated at about 180 million escudos a year (at 1950 valuation). If the earlier import proportion had continued, it would have been necessary to import 120 million dollars worth annually, instead of the real figure of only 43 million dollars worth.

/Table 8

Table 8

CHILE: IMPORTS OF MANUFACTURED PRODUCTS

(In thousands of dollars)

Products	1950	1955	1960	1963
Food products	23.4	45.3	30.0	49.3
Beverages and liquors	0.3	0.8	1.3	0.4
Manufactured tobacco	0.1	0.1	0.1	-
Textile products	14.5	10.9	22.2	17.1
Chemical products	34.9	65.4	60.2	96.7
Metallurgic products	26.8	21.6	31.7	31.5
Machinery and tools	49.6	58.9	104.2	152.7
Transport equipment	20.5	52.7	77.3	74.9
Miscellaneous products	15.8	20.9	38.4	54.3
Total	185.9	276.6	365.4	476.9

Source: Customs Bureau.

(b) Exports

In recent years, the export value of manufactured products has been a little more than 30 million dollars, less than one-tenth of the imports of that nature. In addition, as appears from table 9, there is a definite tendency for these exports to concentrate under a few headings. Only 8 headings accounted for more than 90 per cent of industrial exports in 1955 (see table 10).

Most recently there has been a trend toward diversification; however, 10 headings still represent more than two-thirds of the total value of industrial exports.

Table 10 also shows that the sharp reduction in exports such as wood and manufactured iron, steel and copper has not been compensated for by the growth of new exports such as fish meal, oils and industrial fats.

However, the prospects for the near future in this area are favourable. For example, a marked increase in exports of pulp, paper, iron and steel [23] is expected, with the estimated value of all manufacture exports in 1968 more than tripling that of 1963.

5. Manufactured goods on the domestic market

Using the information of CORFO's National Accounts an estimate can be made of the presumptive domestic supply of manufactured goods, in toto and per inhabitant (see table 11).

It can be seen that in 1963 the level of factory production was only 8.3 per cent above that of 1957, giving a growth rate smaller than that of the population. The same holds true of artisan production. The domestic supply of industrial products per capita diminished therefore between these years.

However, in order to compensate for the insufficient growth of domestic industry, greater quatities of manufactured products were imported, particularly intermediate and capital goods. There was also a decline in industrial exports. As a result the per capita presumptive supply has remained static.

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[23] Early in 1967, the second blast furnace of the steel industry of Huachipato will start operating, with a considerable export surplus.

/Table 9

Table 9

CHILE: MANUFACTURING EXPORTS

(In millions of dollars)

Products	1950	1955	1960	1963
Food products	3.6	3.1	3.4	13.9
Beverages and liquors	1.6	1.6	0.3	1.1
Textile products	1.2	0.4	0.2	-
Chemical products	2.3	2.5	4.7	5.1
Metallurgic products	32.2	25.5	18.4	6.0
Machinery and tools	0.5	1.6	0.4	0.6
Transport equipment	0.1	0.2	0.2	4.3
Miscellaneous products	5.2	3.0	4.9	1.4
Totals	46.7	37.9	32.5	32.4

Source: Customs Bureau.

/Table 10

Table 10

CHILE: MAJOR PRODUCTS IN INDUSTRIAL EXPORTS

(In millions of dollars)

	1955	1960	1963
Tinned fruit and vegetables	-	0.5	0.2
Tinned fish and shellfish	0.3	0.5	0.9
Oils and industrial fats	-	0.5	1.7
Fish meal	-	1.3	9.4
Malted barley	2.1	0.9	0.4
Wines	1.6	0.3	1.1
Wood	15.7	1.7	1.6
Iron and steel	8.7	14.8	3.5
Iron alloys	1.1	1.0	1.5
Processed cooper	7.7	2.6	2.1
Explosives	0.4	1.8	0.1
Totals	37.6	25.9	22.5
Percentage of manufactured products in total exports	93.9	68.3	69.4

/Table 11

Table 11

CHILE: MANUFACTURED GOODS ON THE DOMESTIC MARKET

(In millions of escudos of 1957)

	1957	1963
1. Value of factory production	727	787
2. Value of artisan production	342	369
3. Domestic production (1+2)	1 069	1 156
4. Imports	237	340
5. Total presumptive supply (3+4)	1 306	1 496
6. Exports	24	17
7. Domestic presumptive supply (5-6)	1 282	1 479
8. Domestic presumptive supply per capita	180	179
9. Percentage of imports in domestic supply $\frac{4}{7}$ x 100	18.5	22.0

/The decline

The decline in the domestic contribution to presumptive supply, causing a rise in imports from 18.5 to 22 per cent, that appears from the table is yet another indication of the unsatisfactory growth of Chilean industry.

6. Main characteristics of factory industry

(a) Employment and size of industrial units

It is estimated that in 1963 factory industry [24] was composed of about 6,000 units, employing a total of about 220,000 persons. The average number per factory unit during that year was, therefore, 37 persons.

The distribution of industrial units in 1963 by size and number of employees, according to CORFO's classification will be seen in table 12. Large-scale industries are those with more than 200 employees, medium-scale those with 21 to 199, and small-scale those employing 5 to 20 persons.

Table 12

CHILE: FACTORY UNITS BY SIZE AND EMPLOYMENT, 1963 [a]

Size	Industrial units		Persons employed	
	Number	Per cent	Number	Per cent
Large-scale	190	3	99 000	44
Medium-scale	1 800	30	90 000	40
Small-scale	4 110	67	36 000	16
Totals	6 100	100	225 000	100

[a] Estimate based on Encuesta Industrial, 1957 and taking into account the variations of the following years.

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[24] By "factory industry" is meant industrial units employing 5 or more persons.

/Table 12

Table 12 shows that factory industry has a high percentage of small-scale units, but its large-scale units provide the largest proportion of employment. 3 per cent of factory industry units employ 44 per cent of the workers. In contrast, 67 per cent of the units employ only 16 per cent of the work force.

Medium-scale industry, with 30 per cent of the units, employs 40 per cent of factory manpower. Consequently factory employment is concentrated at both ends of the scale, in either very large or very small units. Small-scale industry averages 9 employees per unit, medium-scale industry 50 and large-scale industry, 521.

Considering employment in terms of industrial groups, intermediate goods industries have the highest average of 95 employees per unit. This is more than twice the average for factory industry as a whole. Metal-transforming industries have an average similar to that of factory industry as a whole. The traditional and miscellaneous industries have a lower average.

As appears from table 13, the following groups typically consists of large-scale units: petroleum and coal derivatives, basic metals, rubber, pulp and paper, non-metallic minerals, tobacco and textiles, all with an average of 50 or more persons per industrial unit.

Medium-scale industry is most typical of the beverages, chemical products, printing and metal-transforming sectors.

Finally, small-scale industry is predominant in the food, wearing apparel and footwear, wood and cork, furniture and fixtures, leather and hides and miscellaneous industries.

(b) Production

The total value of the gross factory product for 1963 may be estimated at about 1,100 million dollars and the gross value added, that is, the addition made to the value of the materials purchased, is estimated at about 500 million dollars. Consequently, the value of inputs (raw materials, energy, fuel and accessory materials) was a little more than 600 million dollars.

/Table 13

Table 13

CHILE: AVERAGE EMPLOYMENT IN FACTORY INDUSTRY

(Employees per industrial unit, estimated for 1963)

	Number of units	Thousands of employees	Average number of employees
A. Traditional industries	4 099	134	33
20. Food	1 500	39	26
21. Beverages	115	5	46
22. Tobacco	8	1	150
23. Textiles	616	40	65
24. Wearing apparel and footwear	1 100	30	27
25. Wood and cork	405	11	29
26. Furniture and fixtures	225	5	20
29. Leather and hides	190	3	13
B. Intermediate industries	752	46	61
27. Pulp and paper	78	4	50
30. Rubber	38	2	52
31. Chemicals	280	13	46
32. Petroleum and coal derivatives	7	1	170
33. Non-metallic minerals	260	13	50
34. Basic metals	89	13	146
C. Metal-transforming industries	825	31	38
35-38. Metalworking and metallurgic	825	31	38
D. Others	424	14	33
28. Printing, publishing and allied	220	9	40
39. Miscellaneous	204	5	24
Factory industry	6 100	225	37

Source: Encuesta Industrial 1957 and estimate for 1963.

A salient characteristic of factory industry is the concentration of production in large-scale industries. This is demonstrated in a CORFO survey [25/] which showed that 12 industrial units alone contributed 20 per cent of factory production, and 40 per cent of large-scale industrial production.

There was a similar concentration of capital: 9 units had 45 per cent of the total for large-scale industry and 25 per cent of the total for factory industry.

These figures show the monopolistic or semi-monopolistic character of Chilean factory industry in most of its branches. Customs protection has often lost its value as a legitimate means of defending native industry against competition from imports. It has led, in many instances, to a desregard for technical efficiency, unnecessarily high production costs, and excessive profit margins.[26/]

Table 14 shows the relative productivity of manpower and capital in factory industry. The manpower productivity of large-scale industry is 71 per cent higher than that of small-scale industry, and 20 per cent higher than that of medium-scale industry. In contrast, capital productivity is much higher in smaller-scale units.

Table 14

CHILE: PRODUCTIVITY RATIOS IN FACTORY INDUSTRY

Types of industry	Value added per employee (in thousands of dollars)	Value added per unit of capital
Large-scale	2.4	0.57
Medium-sized	2.0	0.72
Small-scale	1.4	0.93
Factory industry	2.1	0.65

Source: CORFO, Encuesta Industrial 1957.

[25/] Encuesta Industrial 1957.

[26/] ECLA - Economic Bulletin for Latin America, v.IX, N° 1, March 1964: Protectionism and Industrialization in Latin America states that the average legal customs duty on imports into Chile was 93 per cent of value in 1960. In comparison, Brazil's average was 60 per cent and France's 18 per cent.

The cost structure of factory industry may be seen in table 15. The percentage of material inputs is similar to that of Mexico, Australia and South Africa, less than that of New Zealand and United Arab Republic and higher than that of Argentina, Canada and Brazil.[27] Obviously, no definite conclusions can be drawn from such international comparisons, as the percentages concerned vary according to the production structure of factory industry in all its aspects, which deffers widely in the various countries, as do the supply conditions of material inputs of domestic origin.

Table 15

CHILE: COST STRUCTURE OF FACTORY INDUSTRY

(Percentages of gross production)

Components	Large-scale industry	Medium-scale industry	Small-scale industry	Factory industry
1. Material inputs	54.1	58.8	60.6	56.6
Domestic raw materials	26.3	40.3	48.0	34.3
Imported raw materials	18.7	12.9	9.7	15.4
Accessory materials	3.9	3.1	1.0	3.2
Fuels	3.3	1.5	0.7	2.3
Electric power	1.9	1.0	1.2	1.4
2. Manpower inputs	17.5	15.3	15.9	16.5
Salaries	9.4	7.8	8.3	8.7
Wages	4.4	3.7	3.4	4.0
Legal social security	3.7	3.8	4.2	3.8
3. Miscellaneous	28.4	25.9	23.5	26.9
Total	100.0	100.0	100.0	100.0

Source: Encuesta Industrial, 1957.

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[27] Processes and problems of industrialization in under-developed countries. United Nations, 1955. 1955.II.B.1

The high percentage absorbed by "miscellaneous" is particularly noticeable, this largely consists of profits realized by the entrepreneurs, particularly in large-scale industry, which, as we have seen, is predominantly monopolistic or semi-monopolistic in character.

(c) Capital and forms of control

The estimated total fixed capital of 6,100 industrial units in 1963 was about 750 million dollars, or 123,000 dollars per unit and 3,333 dollars per employee.[28/]

There are, naturally great differences in the various industrial strata as regards invested fixed capital per unit and per employee. Capital density in large-scale industry is 180 per cent more than in small-scale industry and 50 per cent more than in medium-scale industry, while in medium-scale industry it is 85 per cent more than in small-scale industry.

The highest capital density per employee is to be found in the fields of petroleum and coal derivatives, basic metals, non-metallic minerals, chemicals, pulp and paper, and rubber, while the lowest is in wearing apparel and footwear, printing, and furniture and fixtures. There tends to be a high capital density per employee in the larger industrial units, except in the textiles, wood and cork, and leather sectors, where the highest density is in medium-scale industry.

Another important characteristic of factory industry is that in most sectors there is under-utilization of installed capacity, which means a waste of capital resources and, in practice, useless expenditures, with a consequent rise in production costs.

A 1957 CORFO study states that large-scale industry used only 55 per cent of its production capacity, medium-scale 33.1 per cent and small-scale 50.3 per cent.

[28/] This figure is similar to those of other developing Latin-American countries, such as Mexico and Brazil. In contrast, Venezuela, for very special reasons, has an average of 10,000 per employee.

Among the factors repensible for this waste of resources are the following: a strong tendency to concentrate production in a small number of enterprises in specific sectors, inadequate maintenance of machinery and equipment, inefficient organization, a low degree of specialization, and insufficient demand, particularly in articles for popular consumption.

The under-utilization is further demostrated by the fact that a large proportion of industries work on a single eight-hour shift.

Individual owners and limited liability companies control most factory industries. Less than 10 per cent are incorporated, and only 5 per cent are state enterprises or de facto companies.

However, about half of factory workers are employed by stock companies, one-fourth by limited liability companies, about the same by individually-owned enterprises, and four per cent by other types.[29/] This shows that the large-scale units are organized as stock companies.

Chilean factory industry has very few production co-operatives, although this form of organization is of growing importance in other developing countries.

7. Principal characteristics of artisan industry

It is estimated that in 1963 artisan industry was composed of about 70,000 small workshops throughout Chile, with 60 per cent located in the provinces of Santiago and Valparaíso. They employed about 210,000 persons and produced goods worth about 240 million dollars.[30/]

Artisan and home industry is a most important source of employment, giving work to about half of all manufacturing industry employees; it produces about one third of the total manufacturing output.

Its productivity level is similar to that of the total economy; employing eight per cent of the active population it produces eight per cent of the national product.

[29/] Figures from CORFO - Encuesta Industrial, 1957.

[30/] Projection based on CORFO - Encuesta Industrial, 1957. By artisan industry is meant units employing fewer than five persons.

Artisan and home industry provides a living for about 1 million people, or 12 per cent of Chile's total population.

These figures show that the economic and social importance of this sector is still great, although until now it has not been given the aid it deserves.

In Chile, artisan activity is concentrated in 7 sectors: wearing apparel and footwear, wood and cork, furniture and fixtures, metal-transforming industries, printing, and miscellaneous industries. These seven sectors employ 95 per cent of artisan workers, and produce the same percentage of the stratum's output (see tables 3 and 6); all but one are traditional.

This concentration is still more apparent from the fact that only five sectors: wearing apparel, wood and cork, funiture and fixtures, metal-transforming and miscellanueous industries employ 80 per cent of the artisan population and are responsible for 86 per cent of the artisan product.

The principal branch of artisan activity is that of wearing apparel, including making up of clothes and show manufacture and repair. The 80,000 workers involved produce about 100 million dollars worth of goods. Next in importance are the miscellaneous industries in which 31,000 workers produce 25 million dollars worth, and furniture and fixtures with 25,000 workers and a product worth 30 million dollars.

Artisan industry for the most part has out-moded equipment with a correspondingly low yield, and very rudimentary work-methods. Usually the proprietor is manager, accountant, supervisor and worker combined, and most artisan enterprises function in complete ignorance of their real costs. They must buy their raw materials in small quantities, for cash. Their sales often depend on intermediaries, whose profit is usually higher than that of the small peoducer, who in addition finds it very difficult and burdensome to obtain loans.

These characteristics of artisan industry are responsible for the great number of its failures, moreover, its insecurity and inadequate working conditions bear as heavily on its workers as its entrepreneurs.

/Chapter III

Chapter III

INDUSTRIAL DEVELOPMENT PLANS

1. The general strategy of industrial development

Chapters I and II have already given a fairly complete view of Chile's industrial development process. Nevertheless, it seems useful to begin the present discussion of industrial strategy with a brief account of its basis in fact.

Chile's industrial development needs a new strategy, a new pattern of growth. It is essential to recognize the changes that have taken place in the sources from which the impulse to industrialization came in the past, as also in the proper part that industrialization should play in the economy. Moreover, the more or less traditional problems of industrial development have now become critical and new ones have arisen as a result of the inability of the institutional structure and industrial policy to adapt to changed circumstances.

The world crisis of 1930 and later the Second World War stimulated industrial development by creating an unsatisfied demand, a situation which was exploited primarily in the consumer manufacture sectors. Public investment in basic industries such as electric power, fuels and steel together with investment in infrastructural works for communications and transport created a real demand for other manufactured products. These influences were reinforced by easy credit, inflation, real protection by high tariffs, and, except in the immediate post-war period, when an accumulated capacity to import enabled industry to be equipped, a shortage of foreign exchange.

In and after 1955 a significant change took place in the motivation of the industrial development process and, consequently, in its dynamism. Under the anti-inflationary policy government spending was reduced, credit restricted and imports liberalised, resulting in a weakening of demand, particularly for domestic manufactures. This, and the fact that installed capacity was now sufficient for the substitution of imported consumer manufactures, discouraged investment.

/In and

In and after 1959 there was a recovery of demand and investment, but with serious weaknesses in their structure from the point of view of a desirable long-term development. Consumer demand was excessively concentrated on imported manufactures and investment too little directed towards productive activities for the domestic and foreign market that could increase domestic integration and reduce the external vulnerability of the country and of industry. The impulse that came from a greater inflow of external resources spent itself once the country's credit had reached its limit because of the anti-inflationary and control measures then adopted without the support of any more positive provisions for industrial development.

The traditional structure of investment has seriously jeopardized the industrial development of the coming years by its thorough neglect of the intermediate and capital goods industries, particularly in the chemical, steel and machinery and equipment sectors. In the chemical sector this is most evident with regard to fertilizers, petrochemicals and basic products such as acids, chlorine, soda, etc.; the delayed expansion of the steel sector has lost the export market for Chilean steel and has meant that there will have to be imports of semi-processed steel for at least the next two years (1966 and 1967). An inefficient policy has been followed as regards new productions of capital and durable consumer goods, which has allowed production of durable goods to diversify horizontally and has been concerned primarily with satisfying the demand of the high-income sectors. The net balance of exports of manufactures has showed no improvement.

The natural market for manufactures has been a small, high-income class, whose patterns of consumption have been subject to considerable changes. These changes have spread to lower-income groups, which in Chile are readily subject to such influences and were further encouraged by the inflationary climate, in which consumption on credit is normal. Domestic supply has not always succeeded in adjusting its quantities and prices to this demand, giving rise to unsatisfied demand, a strong propensity to direct and indirect imported consumption, inflationary pressures and disequilibria in the balance of payments.

This structural weakness of industry in the last decade may be considered the main cause of its own and the economy's stagnation, in that it has been unable to satisfy demand for consumer manufactures or production goods for its own use and that of other sectors, such as agriculture, mining and transport, or to make the exports that would alleviate the bottleneck in the balance of payments.

Industry's main internal problems derive from certain basic structural factors, such as the monopolistic practices that arose from excessive tariff protection. These, by encouraging cost inflation and preventing the development of new productions on a profitable basis, redound on individual consumers and consuming sectors alike. Another is the poor inflow of private investment into industry, which is due to the weak financial structure of the country and the lack of new studies and projects on the part of the entrepreneurs. Industrial manpower is inadequate at the skilled levels and has a low productivity in general because of the inability of the training systems to supply skilled workers either in sufficient quantities or of the right types; most workers trained are trained in traditional skills. Quality standards present a further problem, particularly if it is desired to export popular consumer manufactures. Again, supplies of the many inputs of foreign origin or controlled by monopolies tend to be irregular and expensive, which adds to stock costs. The end result of these different problems is that industry operates at high cost levels, which are magnified by the quantity of indirect taxes and sales margins that accumulate on any product. They are nothing new in Chilean industry; but if they are now felt to be critical it is because prospects of a rapid industrial development now depend on the expansion of the foreign and domestic markets, which can only take place if costs are lower and quality standards higher.

Industry has more recently been confronted with difficulties arising from the increasing obsolescence of the institutional framework for industrial activity. The legal instruments of this framework and the institutions responsible for the formulation and implementation of industrial policy were created by isolated efforts in different periods and have little organic connexion; either with one another or with the objectives of development; their complexity and inefficiency of administration is a further proof that they lack clear aims.

/Having described

Having described the main features of the situation in which Chilean industry operates, an attempt may be made to outline a strategy for its future development. This will begin with the more general objectives and proceed to the more specific, with care being taken to ensure their compatibility.

The first objective is that the industrial development process should be accelerated, not just because it has been slow in the last decade, but for the less obvious reasons of raising income, creating new sources of employment, and satisfying demand and the needs of other economic activities. Rapid development without industrialisation is not feasible in Chile either over the short or the long term.

In order to sustain a rapid industrial development process Chile must export its manufactures on a massive scale and produce domestically many production goods so far imported. This gives rise to two further objectives: priority development of exports and of basic industries, that is, those producing intermediate capital goods. These would permit a growth quite beyond what is possible on the basis of the demand of a restricted domestic market where substitution of consumer manufactures has already reached saturation point. Basic industry anyway has to operate on a scale which often exceeds the absorption capacity of the domestic market, so that if it is to develop at all part of its production must be exported. The second objective is, therefore, a necessary condition of the third.

Domestic consumption's overall growth must be controlled in order that economic development can be financed with internal savings. This would limit the possibilities of inner-directed growth and further increase the need to export manufactured end products. However, there is one means of expanding domestic final demand for manufactures without increasing total consumption expenditure - income redistribution at both demand and supply levels. This gives rise to a fourth objective: development of production of popular durable consumer goods.

If the objectives of increasing exports and satisfying a popular consumption of durable goods are to be realized, industry must lower its costs and prices. This can be done only through programmes for improving

/the productivity

the productivity and efficiency of existing industry - which makes a fifth general objective - and through the development of an adequate and cheap supply of industry's main inputs under the objective of priority development of basic industry.

It is evident that these five objectives are not just compatible with, but necessary to one another and to the overall objectives of the economy.

There are further general points for which objectives must be established - points which are a permanent source anxiety to certain sectors of the community, finance agencies, etc. and do have some bearing on industrial and economic development.

Two of these, which are closely related, concern state and private initiative and the choice to be made between large-, medium- and small-scale enterprises. The authors' view is that large-scale enterprises are necessary for productions involving economies of scale and, generally, productions for export. Where there is large-scale production for domestic supply state intervention becomes necessary in order to prevent monopolistic practices and thus ensure that the consumer receives the product concerned at the lowest possible price. In addition, these productions involve large investments and if they do not offer an attractive rate of return it is unlikely that the private sector will develop them on its own account. In short, the State should favour private large-scale enterprises only for export productions. Those producing for domestic consumption must have some form of state control when the size of their market does not allow of competition or when their production is of a basic type.

Medium- and small-scale enterprises should be left to private initiative and state action should here be confined to ensuring equal access to credit and otherwise promoting the development of entrepreneurs with initiative. In providing incentives to these strata, however, care must be taken to see that their activities complement rather than compete with large-scale industry, in other words that they manufacture parts and inputs for it in lines which do not involve economies of scale.

/Artisan production

Artisan production still employs as many people as in the fifties. The author's view is that it should engage in highly skilled activities and increase its purchasing power for production and/or organize production co-operatives. State action should be concerned to improve its productivity and productive structure and not to increase its employment.

Foreign investment in industry is another question of the first importance, which deserves thorough examination. The overall régime for foreign investment as regards taxation, returns, withdrawal of profits and capital, rights and responsibilities relative to the autonomous decisions of the national government, etc. is a matter to be considered at the suprasectoral level. However, such investment should also be guided within industry along the same general lines as those established for all private enterprise and specifically towards final and for highly processed manufactures. Use of foreign capital in primary manufactures is only justified when it brings with it technology which cannot be imported in any other way and for foreign markets which it would otherwise be very risky or costly to win.

The industrial development strategy must pay particular attention to regional development since industry can be a main and sometimes the only contributor to the development of regions of Chile that are at present very backward relative to the others. Moreover, the present excessive concentration of industry in the capital is creating external diseconomies as regards urbanization, infrastructure and transport. While this objective is too obvious for discussion in general terms, if it is to be effectively realized much thought must be given to the pattern of regional industrialization and the instruments with which it should be carried out. The automatic grant of privileges to all industries installed in backward regions is not enough, because it cannot ensure that the investments made are socially productive or that the exemption régime is fair, i.e. that artificial industries might not be created and that industries that for reasons connected with natural resources would anyway be installed in the regions concerned would not benefit.

/With the

With the exception of a few that basically engage in raw material production, industries can only develop if the State can build a full-scale infrastructure and provide means of economic access to markets. This makes it all the more necessary to specify the centres in which industry is to be located in the backward regions, the industries that on being installed there can contribute most to the region's and the country's development and the incentives that should be granted them. The nuclei of location must be in the urban centres which provide the best infrastructural conditions or those in which it would be most economical to create them, taking into account all other locational factors.

As regards the type of industry, basic and heavy industries may be counted out from the start, since these are located in accordance with permanent locational advantages inherent in the nature of their activity. Only light industry, therefore, is flexible enough to take part in regional industrial development. The industry concerned can be either for consumer goods production or complementary to the basic activities of the region. Light industry is also the most likely to keep the income generated by it within the region and would have the greatest multiplier effects on the regional economy.

Many industries already established in the provinces are confined to the regional market - with much idle capacity and no prospects of expansion - from having no channels of distribution to the rest of the country. The present marketing channels should, therefore, be studied and new ones developed that will enable provincial manufactures to be distributed to wider markets.

The incentives to be granted to industries suitable for a particular region should form part of a general policy in order to avoid discrimination and the resulting resentment and establish them on a systematic basis. It would be worth exploring the possibility of developing certain regions by integrating their economies with those of regions in neighbouring countries.

These guidelines are very general, but even so do not cover all the points on which decisions must be reached if an industrial development policy is to be formulated and the institutions and sectors of the community

/concerned are

concerned are to take action. They are not intended as a glossary of industrial policy instruments or a manual of specific objectives, but as a mere outline framework. As this strategy is carried on to a more specific level it will require more specific instruments and actions. At this level the full participation of institutions and socio-economic groups is needed in order that the policy carried out may be realistic and fruitful.

2. Industrial programming

The national planning system is headed by the National Planning Office (ODEPLAN), which is subsidiary to the President's Office and is responsible for formulating targets and projections for the main economic aggregates, with sectoral breakdowns where necessary. It is a general programming office which integrates particular programmes and projects into a framework of coherence, feasibility and efficiency in line with government policy that remains in force for a period of at least five years, the present period being 1966-1970.

The formulation and implementation of sectoral programmes is the responsibility of the specialized agencies, such as CORFO in the industrial sector.

ODEPLAN also lays down the methodological principles to be used in sectoral programmes, particularly as regards the presentation of their figures, in order that these can be included in the aggregate projections. Under the system of integral conception and decentralized organization each sector can adopt whatever planning procedures it thinks proper, as long as it keeps in line with ODEPLAN's general principles.

The implementation of plans takes place along largely the same lines. For any plan to be implemented efficiently at all levels its administrators must be fully informed about it. As was stated above, administrators do in fact have to take part in the corresponding levels of plan-making, just because the plans of any institution are drafted or at least supervised and approved by their directors and managers. What is needed now is a substantial change in the way in which wage-earning groups have access to the formulation and implementation of plans. While there are obvious difficulties about this, a socially just and binding solution must be found without delay.

/Chapter IV

Chapter IV

THE CHIEF SECTORS OF MANUFACTURING INDUSTRY

A. FOOD INDUSTRIES

1. The fisheries industry

(a) Diagnosis

In spite of the extraordinary wealth of Chile's marine resources, which constitute an inexhaustible source of supply for the domestic market and for a large foreign demand, the domestic fisheries industry developed at a slow and unsteady rate until 1959. An inquiry made into the industry revealed that this was essentially due to the following factors:

(i) Lack of detailed knowledge of the abundance, spatial and temporal distribution and variations of the fish resources;

(ii) Lack of interest among the population in taking up employment in any level of fisheries production;

(iii) Lack of material resources, such as large boats for trawling and seining, ports, adequately equipped bays or terminals and gear for the different catches of fish and shellfish;

(iv) Inadequate credit policy for installation or expansion projects for the industry and purchase of capital goods, boats and equipment, etc.;

(v) Lack of continuity in technical assistance and the poor diffusion of results of experimental work;

(vi) Lack of legislation for regulating the industry and stimulating its development (this changed in 1959);

(vii) Lack of an adequate policy governing the marketing of marine products, particularly in the fresh state.

As a result, until 1959 Chilean fisheries production bore no relation to the exploitable resources and remained comparatively small.

(b) Promotion of the industry

The obvious need to develop the fisheries industry, which was considered by the national economic development programme to be a basic activity, led the Government at the end of 1959 to commission the Development Corporation to prepare a fisheries development programme. This recommended the following measures:

/(i) Creation

(i) Creation of a Fisheries Promotion Institute. This was carried out by CORFO and the Ministry of Agriculture with assistance from the United Nations Special Fund. The institute is an autonomous body whose basic tasks are to conduct research into marine resources and train personnel for the industry, in furtherance of its growth and productivity.

(ii) Intensive training courses. Intensive courses for fishing boat masters and engineers were organised by CORFO through one of its affiliates, the Technical Assistance Service.

(iii) Increase of material resources and financial assistance. Credit policy was overhauled. In its present form medium-terms low-interest loans are granted to expert fishermen and boatyard owners for the purchase of boats, marine engines, nets and fishing gear and to industrialists of the sector for boats, equipment and installations, and civil works. Special credit lines established for boatyard and dock owners have resulted in the expansion and installation of dockyards, where steel fishing vessels of 110 to 220 tons hold capacity have been built.

To promote the installation of fish meal and fish oil industries in the North, a 100 hectare industrial estate, with drinking water supplies, sewerage, electricity, lighting and internal and access roads has been built for them at Iquique. And since the North had no ports or shipways capable of coping with the large, new fishing fleet, CORFO built a service port for this purpose at Iquique.

(iv) Technical assistance. Under an agreement with the Institute of Inter-American Affairs (IIAA) several foreign consultants have come to Chile to advise Chilean experts and industrialists on preserving plants, fish meal plants, markets for fisheries products, transport, the organization of fisheries co-operatives and other matters.

(v) Promotion legislation. The Development Corporation, the Ministry of Agriculture and other agencies jointly promoted the passage of Decree-Law No. 266 of 1960, which grants various privileges to the fisheries industry. Among the chief of these are the exemption from customs duties of all materials, equipment, machinery and installations for use by the industry or persons concerned in fishing itself and an exemption from sales tax and a substantial reduction in other taxes for the products of the industry.

/(vi) Marketing.

(vi) Marketing. The problems of distribution have been met in Santiago by the construction of a reception terminal with storage rooms, accessory services, etc. for all the marine products destined for general consumption, from which they are sold to wholesalers. It has improved on the old distribution system by providing complete prior hygienic control, centralizing and regulating supply, intensifying quality competition, eliminating the intermediaries who raised and often speculated unjustifiably with prices, and allowing direct marketing by co-operatives and small enterprises.

Similar terminals will be installed in the provinces. A project for one in Valparaíso has already been prepared and the Fishermens' Co-operative of Valdivia has begun studies for one in that city.

(c) Development of the industry

With the support of the above mentioned privileges and of the material and credit facilities recently provided a large proportion of the fisheries industry (preserving and catching for sale in the fresh state) in the Central Region and the South has been modernized and expanded. Moreover, many of the existing industries have diversified their production so as to include frozen fish and shellfish and chilled fish. However, the greatest expansion has occurred in the North, where there has been a heavy concentration of private investment in fish meal and fish oil manufacture.

The rapid growth of the industry at Iquique will appear from table 16.

Table 16

CHILE: NUMBER OF PLANTS AND INSTALLED CAPACITY IN THE FISHERIES INDUSTRY AT IQUIQUE

Date	Number of plants	Installed capacity (tons/hour)
January 1961	1	19
January 1962	3	65
January 1963	5	91
January 1964	9	176
January 1965	17	535
January 1966	23	785

Arica has had a slower growth: from 2 plants in January 1961 with 43 tons/hour installed capacity to 7 in January 1966 with 275 tons/hour capacity (two small old plants are not included). The present situation in the North as regards capacity and its location can be seen in table 17.

Table 17

CHILE: LOCATION OF INSTALLED CAPACITY IN FISH PROCESSING PLANTS IN THE NORTH

Port	Plants in operation	
	Number	Capacity (tons/hour)
Arica	7	286
Pisagua	3	56
Iquique	23	785
Patillo	1	40
Tocopilla	1	25
Mejillones	1	25 a/
Antofagasta	2	18
Taltal	1	10
Total	39	1 245

a/ In construction.

Along with the development in processing plants in the region there has been an increase in its fishing fleet, from 65 boats in 1963 to 270 in 1965.

Moreover, a combined refrigeration and canning plant has recently been installed there, increasing the number of its refrigeration plants to two and that of its canning plants to five.

In the rest of the country there are 28 canning industries and 8 refrigeration industries. Some of these also produce fish for sale fresh and have small fish meal plants for processing the by-products of their other lines of production. All the fish meal thus produced is consumed domestically.

Total government investment in the fisheries industry development plan was approximately 40,000,000 dollars, 30,000,000 in the form of loans and guarantees granted by CORFO and 10,000,000 directly invested by the State. It is estimated that the private sector has invested in specific projects a sum similar to this total, most of which came from external loans, that it obtained without government mediation.

It is estimated that the above measures have created jobs for about 6,000 more persons in the industry.

(d) Production

The following tables show the growth of the fisheries industry in the last few years.

Table 18

CHILE: FISHERIES PRODUCTION, 1959-1964

(In metric tons)

Year	Total fisheries production	Production and export of fish meal	
		Production	Export
1959	273 000	29 900	16 413
1960	340 000	31 000	18 000
1961	430 000	60 000	48 000
1962	640 000	91 600	67 400
1963	762 000	107 400	85 700
1964	1 161 000	174 700	146 400

The overall production of the previous table consists of the following items:

/Table 19

Table 19

CHILE: VOLUME OF FISHERIES PRODUCTION BY TYPES OF PRODUCT, 1961-1964

(Tons)

Type	1961	1962	1963	1964
Fresh fish	41 000	44 200	57 000	62 900
Fresh shellfish	16 500	18 500	22 500	28 700
Frozen fish and shellfish	10 000	11 800	12 500	15 800
Canned fish and shellfish	24 000	33 500	33 400	38 800
Dried fish	-	-	11 200	900
For fish meal	338 500	532 000	625 400	1 013 100

Lastly, table 20 shows the main exports of marine products in the last few years.

/Table 20

Table 20

CHILE: EXPORTS OF MARINE PRODUCTS, 1961-1965

Products	1961		1962		1963		1964		1965 (up to 30 September)	
	Thousand dollars f.o.b.	Tons	Thousand dollars f.o.b.	Tons	Thousand dollars f.o.b.	Tons	Thousand dollars f.o.b.	Tons	Thousand dollars f.o.b.	Tons
Whale oil	545	2 649	1 013	4 866	381	1 752	572	3 426	1 095	5 574
Fish oil	328	2 937	298	10 386	1 255	11 895	2 039	13 712	1 183	6 873
Agar-agar	13	6	3	1	48	15	55	18	60	17
Seaweed	440	1 729	139	a/	289	1 846	507	2 778	575	2 643
Frozen shrimps and crayfish	1 302	1 055	1 699	1 159	1 728	1 048	2 385	1 440	1 861	1 125
Whale meat	a/	a/	a/	a/	a/	a/	61	7 972	350	6 548
Whale meal	81	1 099	80	248	200	1 764	221	1 877	258	2 344
Crayfish meal	12	313	30	595	24	499	26	589	31	655
Fish meal	3 698	47 068	7 858	71 759	9 189	85 731	15 748	143 330	7 685	64 051
Fresh and canned shellfish	176	112	174	92	223	101	328	166	257	139
Frozen fish	2	1	-	-	32	241	120	660	299	1 818
Fresh and canned fish	28	59	1	5						

Source: Central Bank (extraofficial data).

a/ No data available.

/2. The

2. The sugar industry

(a) Apparent consumption

Refined sugar consumption has been determined from the sales information provided by the National Sugar Industry S.A. (IANSA) and Sugar Imports Co. Ltd. (IMASOL), a company formed by the sugar mills to import their raw sugar inputs. Table 21 shows how this consumption has evolved in the last few years.

Table 21

CHILE: APPARENT CONSUMPTION OF SUGAR, 1960-1964

(Metric tons unless otherwise specified)

Year	IANSA	Sugar mills	Free ports	Donations	Total	Per capita consumption (kilogrammes)
1960	55 820	157 024	9 371	8 195	230 412	30.15
1961	55 237	156 938	17 308	8 791	242 274	30.80
1962	67 334	180 809	18 676	-	266 819	32.85
1963	82 672	162 185	14 800	-	259 657	31.20
1964	90 460	147 735	14 500	-	252 695	29.28

It is estimated that the 1975 apparent consumption will be 384,000 tons.

(b) Production and imports

Table 22 shows domestic production and imports of raw sugar in the last five years, according to information supplied by the Statistics and Censuses Department.

Table 22

CHILE: SUGAR PRODUCTION AND IMPORTS, 1960-1964

Years	Production (Tons raw sugar)	Imports (Tons raw sugar)	c.i.f. value (dollars)
1960	62 000	112 174	10 220 000
1961	61 370	206 251	15 437 000
1962	74 820	110 682	8 164 403
1963	91 860	248 734	19 835 419
1964	100 510	137 769	26 132 091

/The mills

The mills import their raw material, raw sugar with 95 to 97.5 per cent sucrose.

In 1950-1964, 2,578,000 tons of raw sugar and 96,507 tons of refined sugar were imported, representing 302 and 28 million dollars of 1964 respectively. The average annual value of total sugar imports was, therefore, roughly 21 million dollars of 1964.

(c) Production and installed capacity

The beet sugar industry is an agricultural-industrial complex, whose operating characteristics are largely determined by the seasonal nature of sugar beet cultivation. In Chile the growth cycle of sugar beet is from September-October of one year to April-September of the next. Processing, therefore, is carried out for periods of 120 to 170 days, depending on climatic conditions. In the jargon of the activity these periods are called the "campaña" (campaign).

The beet sugar industry is controlled by a single company, the National Sugar Industry S.A., which has three processing plants, at Linares, Los Angeles and Llanquihue, which came into operation in 1959, 1954 and 1958 respectively.

While the rated beet processing capacity of each plant is only 1,600 tons per 24 hours, their flexible layout, the excellent quality of Chilean beet, the efficiency of their operative personnel, the favourable climatic conditions of the country, and the improvements made in their equipment have enabled them to achieve in the last three campaigns - 1962-63, 1963-64 and 1964-65 - total refined white sugar productions of 98,644, 99,640 and 95,257 tons respectively. It may be mentioned that plants of similar capacity in Europe, from the rigours of the climate and the poor quality of the beet, rarely surpass 23,000 tons of white sugar per plant per campaign.

Although the plants are comparatively new, their ages ranging from 7 to 12 years, IANSA's management has taken special care to keep their productivity levels high by replacing equipment and installations where improvements seem advisable on technical or economic grounds.

/In accordance

In accordance with the seasonal nature of their operations, beet sugar mills require two kinds of manpower: skilled staff and operatives who perform key functions in the running of the plant and are employed permanently, and extra, temporary labour hired for each campaign to carry out secondary activities of an unskilled nature.

IANSA at present employs 910 permanent staff and operatives and takes on a further 190 staff and 1,100 workers for the four to seven months of the campaign.

Since the plants are of the continuous process type, they require a fairly small amount of manpower for manufacturing operations and consequently have high productivity levels.

(d) Cost factors

IANSA's cost fall into two main headings:

(i) Production costs;

(ii) Costs of technical assistance to beet growers and agricultural development.

The production costs cover processing of sugar beet of an average sucrose content of 16 per cent.

Expenditure on technical assistance and agricultural development is unrelated to production and is made in direct benefit of growers. It comprises the technical assistance given to each grower, research into problems of beet growing, free-of-charge delivery of crops, freight subsidies, payments for road improvements, etc.

Table 23

CHILE: COST STRUCTURE OF IANSA, 1960-1965

Heading	1960	1961	1962	1963	1964	1965
Beet	51.84	42.17	47.63	56.33	51.62	60.15
Variable costs	10.93	9.47	9.84	9.70	7.36	10.13
Fixed costs	13.52	22.04	23.21	11.70	12.45	21.63
General expenses	23.71	26.32	19.32	22.27	28.57	8.09
Total cost	100.00	100.00	100.00	100.00	100.00	100.00

/The sales

The sales price to the public of sugar is fixed by the Ministry of Economic Affairs, Trade and Reconstruction according to the c.i.f. value of imported raw sugar and not the cost of domestically produced sugar.

The following table gives the 1965 ex-factory prices without tax of a ton of refined sugar in a number of countries, at an exchange rate of 3.055 escudos to the dollar.

Germany	1 552 E°/ton
Holland	1 456 "
Belgium	1 456 "
France	1 373 "
Spain	1 595 "
Italy	1 705 "
Chile	678 "

(e) IANSA's future development

The industry is considered to have favourable prospects of development for the following resons:

(i) Chile could produce enough sugar beet to supply the total sugar consumption of a population over double the present. During the last few years there have been many farmers of different areas who have applied to make beet supply contracts with IANSA and have had to be turned down from want of processing capacity. Its other major inputs, limestone, charcoal and paper containers are readily and cheaply available in the country. Moreover, IANSA's demand is helping to reanimate other sectors of the economy, such as charcoal production, and to create new activities, such as limestone quarrying;

(ii) The trained manpower that it needs can be recruited among university graduates, in the case of high-level staff, and among industrial school trainees, in the case of workers. In both cases manpower of the right quality and in sufficient numbers is available.

/Its temporary

Its temporary manpower largely consists of agricultural workers, who during the campaign season have no other source of employment. It trains all its own personnel, for which it has a fully organized training system;

(iii) The expansion of the industry will give rise to agricultural employment on a scale unprecedented in Chile. At present about 11,000 agricultural workers work permanently throughout the year in beet growing and harvesting. In 1964 beet growing occupied 1 per cent of the area devoted to annual crops and its workers received 6 per cent of all agricultural wages;

(iv) IANSA has no obstacles to expansion on the demand side, because besides substituting raw sugar imports it will have to satisfy the natural increase in demand as a result of population growth;

(v) Foreign loans for building new plants or investing in further capacity are permanently available on easy terms.

In view of the extent of beet growing and processing's contribution to agriculture and economic development in general, of the benefit to the balance of payments that comes from domestic sugar production, and on the other hand of the fact that IANSA's present installed capacity is too small for it to accept more than a proportion of the applications of potential beet growers, the Government resolved vigorously to promote the expansion of the industry.

As a result, the Linares plant operated in 1966 with a capacity expanded by 50 per cent to 2,400 tons of beet per day.

In 1967 a plant of 3,000 tons processing capacity is to begin operating at Ñuble and the Los Angeles and Llanquihue plants are to have their capacities increased to 2,000 tons of beet per 24 hours.

Building work on the Ñuble plant and the alterations in the Los Angeles and Llanquihue plants are already under way.

With regard to long-term development, IANSA has in preparation an expansion plan that will provide an overall economic model for sugar production and transport on a scale capable of satisfying the whole of domestic demand within the next 10 years.

The studies for this are now far advanced and show, according to the data so far analysed, that Chile has large areas of land that could be used for beet growing without displacing basic crops. It has recently been anounced that further plants are to be built at Valdivia and Curicó.

/B. THE

B. THE BASIC FOREST PRODUCTS INDUSTRY [31]

1. Background information

Table 24 lists the different basic headings of the Chilean forest products industry, giving figures for the 1965 log consumption (in solid cubic metres of uncut logs), installed capacity and annual production of each. Total log consumption in 1965 was almost 4,100,000 solid cubic metres, of which about 60 per cent was used for sawnwood, 27 per cent for pulp and paper production, 10 per cent for round wood products, sleepers, etc., and only 3 per cent for sheet materials.

A large proportion of the above total - 2,146,000 solid cubic metres or 52 per cent - consists of logs of pinus insignis (pinus radiata or Monterrey pine) - see table 25.

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[31] Forest products divide into two groups: sawnwood and wood-based sheet materials. The latter divides further into:

1) reconstituted wood (particle board);
2) fibreboard;
3) plywood; and
4) veneers.

Pulp and paper are not considered in this section but are included in some of its tables in order to give an overall picture of certain aggregates such as raw material consumption. They will be treated in full in the next section.

/Table 24

Table 24

CHILE: RAW MATERIAL CONSUMPTION, INSTALLED CAPACITY AND PRODUCTION OF THE BASIC FOREST PRODUCTS INDUSTRY IN 1965

Heading	Raw material consumption	Installed capacity	Annual production
Sawnwood	(solid m^3 of logs)	(solid m^3 of products)	
Pinus insignis	990 000	680 000	500 000
Others	1 480 000	800 000	744 000
Sub-total	2 470 000	1 480 000	1 244 000
		(Metric tons)	
Reconstituted wood (particles)	45 000	22 600	15 000
Fibreboard	39 000	12 000	13 000
Plywood	21 000	17 000	7 000
		(Square metres)	
Veneers	2 000	1 600 000	1 000 000
		(Metric tons)	
Pulp and paper	1 100 000		
Pulp		80 000	85 000
Newsprint		130 000	100 000
Other paper and paperboard		50 000	40 000
Miscellaneous (roundwood products, sleepers, etc.)	435 000	500 000	435 000
Total raw material consumption (solid m^3)	4 097 000		

Source: Forestry Institute, Wood Corporation (CORMA), CORFO.

/Table 25

Table 25

CHILE: CONSUMPTION OF PINUS INSIGNIS LOGS IN 1965

	Solid m^3	Percentage of each heading in the total
Sawnwood	990 000	40
Reconstituted wood	30 000	100
Fibreboard	36 000	100
Pulp and paper	1 090 000	99
Total	2 146 000	52

Sources: CORFO and CORMA.

2. Present situation and prospects of the industry by process headings

(a) Sawnwood

The most striking characteristic of 1965 output (estimated) was the large proportion of pinus insignis wood in the total (40 per cent). This has tended increasingly to displace native woods in recent years and it is estimated that within a not very distant future it will account for over 80 per cent. This is directly due to the progressive depletion of the economically exploitable native timber resources, which have had to be replaced by artificial plantations of fast-growing species, of which pinus insignis is one.

It is also due to the installation of 11 new mechanised sawmills in the region of the pinus insignis plantations in the last few years, whose rapid turnover and high-quality output have enabled Chile to compete in the international markets.

Starting from present demand, which is the same as output (1,244,000 sawn cubic metres in 1965 or 520 million board feet), CORMA estimated that of the next 25 years as follows:

/Table 26

Table 26

CHILE: PROJECTED DEMAND FOR SAWNWOOD

(Millions of board feet/year)

Quinquennium	Pinus insignis	Other species	Total
1965-69	290	330	620
1970-74	480	310	790
1975-79	730	285	1 015
1980-84	1 050	235	1 285
1985-89	1 415	220	1 635

Source: CORMA.

The domestic market for sawnwood will be determined largely by the housing plans of these periods.

Most of sawnwood exports in recent years consisted of pinus insignis, which also has the best prospects of export. Sawnwood export prospects in general are good, in view of the markets opened up in Europe and Israel in 1964. Argentina's, Uruguay's and Peru's needs will increase substantially when their respective governments' housing plans begin to be carried out. Moreover, these three countries have liberalized sawnwood imports under LAFTA agreements.

Table 27 gives the Forestry Institute's breakdown of sawnwood output in the next few years by domestic market uses, with the resulting export surpluses. The output figures of this estimate are slightly higher than CORMA's in the preceding table.

/Table 27

Table 27

CHILE: PROBABLE DEMAND FOR SAWNWOOD, BY USES

(Millions of board feet)

Use	1959-61	1970	1975	1980
Building	142	234	257	282
Packaging	55	68	76	84
Furniture	11	21	24	29
Civil works	40	76	125	180
Other	10	20	40	50
Total domestic demand	258	419	522	625
Exportable surpluses		371	500	600

Source: Forestry Institute, Informe Técnico No. 14.

Real exports in 1964 - the last year for which there are data - amounted to 30 million board feet, worth about 3 million dollars. In 1954 and 1955, 84 million board feet were exported, with a value of 16 million dollars.

As appears from the table, the main domestic use of sawnwood will be in building (forming frames, doors, windows, floors, partition walls, prefabricated houses, etc.) and the next in civil works (bridges, boat building, port constructions, bodywork of vehicles, etc.). These are followed by packaging furniture and then the miscellaneous uses such as toys, moulds shoe heels, tool handles, etc.

(b) Reconstituted wood (particle board)

The first reconstituted wood plant was installed at Curacautín in 1955. It uses the extrusion process, with Araucaria araucana as the raw material. Its capacity is 7,200 tons/year, but it is at present practically at a standstill. The uses of its product are greatly restricted by its poor physico-mechanical properties.

/A second

A second plant was installed at Valdivia in 1964. It uses pinus insignis raw material and produces panels 3.60 metres long by 1.80 metres wide by 6 to 24 millimetres thick. Its capacity is 6,400 tons/year.

A third plant came into operation at Chiguayante half-way through 1965, which also uses pinus insignis and has a capacity of 9,000 tons/year on three shifts a day. It produces panels 4.84 metres long by 1.52 metres wide by 6 to 45 millimetres thick.

In Europe and the United States the reconstituted wood industry has been expanding with extraordinary rapidity since 1950, as have its consuming markets. At present about 90 per cent of the furniture manufactured in Europe is made of this material.

The product has had a similarly wide acceptance in Chile, where its consumer market, mainly consisting of the building and furniture industries, has grown rapidly.

The two main factories in operation are not able to satisfy present demand. Both have plans for increasing their individual capacities to 20,000 tons/year by 1970 and 30,000 tons/year by 1975-80. One is now carrying out a 30 per cent expansion which will come into operation in 1967.

To sum up, in 1965 the joint capacity of the three factories was 22,600 tons/year and they produced 15,000 tons. They are expected to produce 47,200 tons in 1970 and 67,200 tons/year in 1975-80.

(c) Fibreboard

Chile has only one fibreboard factory, which was installed in 1959 in the town of Cholguán in Ñuble province. Its production capacity is 12,000 tons/year. It produces hard panels 4.86 metres long by 1.52 wide by 3 to 6 millimetres thick and insulating panels 2.43 metres long by 1.52 metres wide by 12 to 33 millimetres thick. All its raw material is pinus insignis for which it has its own plantations, now 2,000 hectares but to be increased to 5,000 in the next two years. Work recently began on a two-stage expansion of the plant to 20,000 tons/year. The extra capacity will come into full operation in 1970.

The whole of its output is consumed domestically. In some years there have been deficits, to cover which it was operated at over full capacity and fibreboard was imported (3,000 tons/year in 1963 and 1964). In January and October 1964, the Housing Corporation (CORVI) specified the use of fibreboard for doors and parquet flooring respectively, but it has not yet permitted its use in wainscoting.

Table 28

CHILE: FIBREBOARD PRODUCTION AND ITS PROBABLE EXPANSION

(Tons)

1959	3 100
1960	7 600
1961	8 900
1962	9 000
1963	9 500
1964	10 000
1965	12 937
1966	15 000
1967	18 000
1970	20 000 a 22 000

Source: Forestry Institute and CORFO.

The owners of the factory have begun to export their products to Peru (about 1,414 tons with an f.o.b. value of 103,584.95 dollars between August 1963 and March 1965) and recently made an experimental shipment to the United States.

According to the firms sales forecast, domestic demand will increase by 82 per cent in the next ten years. Free capacity will be used to supply the Ecuadorian and Peruvian markets, which at present import from Sweden, Finland, Canada and Brazil, as well as Chile. It estimates that 2,800 tons could be exported on average every year, bringing in about 210,000 dollars in foreign exchange.

/(d) Plywood

(d) Plywood

Plywood was the first of the panel woods to be produced in Chile, since one of the two major firms now making it began operations in 1938. This has its chief plant at Curacautín, 750 kilometres south of Santiago. The other has been operating a plant at Neltume, Panguipulli, Valdivia province, 950 kilometres south of Santiago, since 1940.

The first plant uses *Araucaria araucana* of which it has its own reserve of 30,000 hectares. Its production capacity is 11,500 cubic metres/year of panels 2.20 metres long by 1.425 metres wide by 3 to 20 millimetres thick. The other uses *coigüe* (*Nothofagus dombeyi*), *raulí* (*Nothofagus procera*) and *tepa* (*Laurelia serrata*), also from its own reserves. Its capacity is 2,500 cubic metres/year of panels 2.10 metres by 0.80 metres by 4 to 20 millimetres thick.

Plywood is mostly used in Chile in the building industry, to make doors, partitions and panels and for concrete moulds. It is also used in the furniture and boat-building industries.

Plywood production exports and imports during the last few years are shown in table 29.

Table 29

CHILE: PLYWOOD PRODUCTION, FOREIGN TRADE AND APPARENT CONSUMPTION

(Cubic metres)

Year	Production	Exports	Imports	Apparent consumption
1950	10 000	2 453	-	7 547
1951	12 000	4 417	1	7 584
1952	11 000	823	-	10 177
1953	12 000	490	-	11 510
1954	12 000	872	-	11 128
1955	11 000	1 059	38	9 979
1956	4 000	391	41	3 650
1957	7 000	65	904	7 839
1958	6 100	285	94	5 909
1959	8 900	172	38	8 766
1960	6 200	59	39	6 180
1961	7 700	50	79	7 729
1962	7 840	-	84	7 894
1963	6 944	-	119	7 063

Source: Forestry Institute, *Informe Técnico No. 5*.

/As appears

As appears from the table, half-way through the fifties domestic consumption declined from about 12,000 cubic metres to about 7,000 cubic metres a year, where it has remained. Exports have dwindled to zero. Since the joint capacity of the two plants described above is 14,000 tons/year they must be operating with about 50 per cent idle, or even more if the small-scale producers are taken into account.

In spite of the building boom of the last five years and the resulting growth of demand for forestry products, per capita consumption of plywood has declined in Chile, at a time when it has been on the increase in the rest of the world, with prospects of a still more rapid rise in future. Chile's per capita consumption is among the lowest of those of a group of foreign countries with which it has been compared, even though it is a forested country and formerly exported plywood.

Its low consumption may be attributed to backward, and hence costly, production processes, lack of product classification and quality control, an irrational marketing system and feeble sales promotion, which has allowed substitutes to take over the market.

Government cheap housing plans should expand the domestic market in future. The evolution of consumption is estimated by the Forestry Institute as follows:

Table 30

CHILE: PROBABLE FUTURE CONSUMPTION OF PLYWOOD

(In thousand cubic metres)

Period	Annual consumption
1959-61 (apparent consumption registered)	7.6
1970	18.0
1975	32.0
1980	47.0

Source: Forestry Institute, Informe Técnico No. 14.

/As regards

As regards supply, it is estimated that, taking into account the two enterprises now in operation, a new plant soon to begin production and the several small producers, installed capacity will increase from the 17,000 cubic metres of 1965 to 22,000 cubic metres in 1970.

It is interesting to note that even though there are sufficient prospected reserves (at Vilucura, Liquiñe, etc.) for the raw materials at present used by the industry (*coigüe*, *tepa*, *araucaria*, etc.) there are studies at an advanced stage for the manufacture of plywood from *pinus insignis* (Forestry Institute, *Boletín Informativo No. 8*, 1964) with already, at the start, two major enterprises interested in doing so. However, since the minimum economic capacity of a plywood plant is about 10,000 tons/year and the market of the *pinus insignis* based product (forming moulds, buildings, etc.) is still relatively small, these projects will not be carried out before 1970. Another problem for them is the difficulty of obtaining logs of sufficient diameter, for which trees about 40 years old are needed.

(e) Veneers

The oldest and best-equipped factory of the country is at Valdivia. It was built in 1945 and produces a wide range of face-veneers up to 1.2 millimetres thick and commercial or container veneers (thicker and coarser) 2 and 3 millimetres thick by the rotary-cutting and horizontal slicing methods. It recently expanded its production capacity to 1,500,000 square metres/year on one shift.

There are also a number of small plants, of a negligible joint capacity.

Veneers are mainly used in the furniture industry and, recently, for direct facing of walls. There have also been experimental productions of veneer-faced plywoods. Their main purpose is to improve the appearance of wood and other less costly materials, allowing articles of apparently great value to be produced very cheaply. Most of the woods used for veneer making are native: *coigüe*, *tepa*, *olivillo* (*Aextoxicon punctatum*), *lingüe* (*Persea lingue*) and *mañío* (*Podocarpus nubigenus*, *Saxegothaea conspicua* and *Podocarpus andinus*). Eucalyptus, an artificial species, and imported logs of species such as *caoba*, *jacarandá* (rosewood), etc. which are not grown in Chile are also used.

/Table 31

Table 31

CHILE: VENEER PRODUCTION AND ITS PROJECTED EXPANSION

(Thousand square metres)

1962	450
1963	600
1964	800 a/
1965	1 000 a/
1970	4 500
1975	6 000
1980	7 000

Source: Forestry Institute, Informes Técnicos Nos. 4 and 14.

a/ Estimates.

Veneers have not yet been exported, but veneer logs have, mainly to Argentina, the United States and Europe. The species in most demand is coigüe, which in Europe has been found preferable to European cherrywood, much used in furniture making, and has been given the fictitious name of Tierra del Fuego cherry.

A new modern veneer factory with a capacity of 3,600,000 square metres of veneers a year on two shifts is now being installed at Valdivia. The enterprise has plans to expand its production beyond this in the next few years. Much of its output is said to be already contracted for by German buyers.

A third factory at Valdivia, of a capacity of about 800,000 square metres/year, is projected.

There are excellent prospects for exports of veneers, particularly to the European and United States markets, which latter seems to have been unaccountably neglected in the projects at present under study. Chile has more than ample raw material reserves, whose exploitation could become a major foreign exchange earner.

/To sum

To sum up, production capacity, now calculated at 1,600,000 square metres/year including a number of small producers, will rise to 4,500,000 square metres a year by 1970.

(f) Miscellaneous

This heading includes telephone and telegraph poles, fence and other posts, sleepers, mine timbers, etc.

Table 32

CHILE: PRESENT APPARENT CONSUMPTION OF ROUNDWOOD PRODUCTS, SLEEPERS, ETC. AND PROBABLE FUTURE DEMAND

(Thousand cubic metres)

Headings	Apparent consumption 1965	1970	1975	1980
Telephone and telegraph poles	5.6	13	13	13
Fence posts	90.6	156	184	212
Sleepers	139.0	100	100	100
Others (mine timbers, etc.)	200.0	200	200	200
Total	435.2	469	497	525

Source: Forestry Institute, Informe Técnico No. 14.

3. Raw material resources

Chile's forest resources divide into two major categories, natural forest and artificial plantations, which will be treated separately in the present section.

(a) Natural resources

The area covered by natural forest in Chile is estimated at over 20 million hectares, which represents 2.5 hectares *per capita*, compared with a world average of 1.5. About 9.8 million hectares, roughly 49 per cent, are considered to be accessible, giving 1.2 hectares accessible *per capita*, against a world average of 1.0. Most of the accessible natural forest is privately owned.

The chief tree varieties of the natural forest and their percentages in the total of natural forest resources are as follows:

Table 33

CHILE: MAIN NATURAL FOREST TREE VARIETIES

Varieties	Percentages of total natural forest resources
Coigüe (Nothofagus dombeyi)	35.0
Tepa (Laurelia serrata)	23.0
Ulmo (Eucryphia corditolia)	8.0
Tineo (Weinmannia trichosperma)	7.0
Mañio (Podocarpus nubigenus, Podocarpus andinus, Saxegothaea conspicua)	4.1
Olivillo (Aextoxicon punctatum)	4.0
Total	81.1

According to the most recent estimates - made by the FAO-sponsored Ingler Mission - the annual growth of the natural forest is about 11.8 cubic metres a year. But only a small fraction of this is being used for industrial purposes, since the logs of natural species used in the total production of sawnwood, plywood and veneers amount to less than 1.5 million cubic metres a year.

(b) Artificial resources

Chile has supplemented its native forest resources with a sizeable area of plantations. These are estimated at 300,000 hectares, of which 90 per cent is occupied by pinus insignis and the remainder by eucalyptus, poplar, cypress, etc. The average annual growth is 18 cubic metres per hectare and the total estimated at 3 million cubic metres, which it is hoped to raise to 5 million in the present decade. This average is 8 times that of the Scandinavian conifer plantations and gives an average cost of wood of 1.79 dollars per cubic metre, one-fifth or one-sixth of that

/of standing

of standing wood in the Scandinavian countries (from A. Sundelin, Chile, potential pulp and paper exporter, Santiago, 1957). The main plantations are in the southern third of Chile, in the provinces of Arauco, Bío-Bío, Concepción, Linares, Malleco, Maule and Ñuble. Over a third are in the province of Concepción where almost all of them are owned by individuals or private enterprises.

As was shown in table 25, 50 per cent of the 2.15 million solid cubic metres of pinus insignis logs produced in 1965 were used in pulp and paper manufacture, 47 per cent for sawnwood and a bare 3 per cent for fibreboard and reconstituted wood.

4. General characteristics of the industry

There is no recent information on employment and capital invested in the industry. The estimates here given date from 1961 and are based on the previous industrial census, carried out in 1957.

Table 34

CHILE: GENERAL CHARACTERISTICS OF THE BASIC FORESTRY PRODUCTS INDUSTRY, 1961 a/

Industrial sector	Estimated number of persons employed b/		Estimated capital invested		
	Total	Percentage	Total (millions of dollars)	Percentage	Dollars per person employed
Pulp and paper c/	3 200	20 to 25	45	60 to 65	15 000
Sawnwood	8 000 to 10 000	65 to 75	20 to 25	30 to 35	3 000
Plywood	600	4 to 5 7 to 8	1.9	2.5 to 3 8 to 9	3 500
Veneers d/	150		0.6	-	4 000
Fibreboard	190		3.0	4 to 4.5	16 000
Reconstituted wood	100		0.5	-	5 000
Total	12 000 to 15 000	100	70 to 75	100	

Source: Forestry Institute, Boletín Informativo No. 1, 1962.

a/ Excluding charcoal, furniture, manufactured products, machine-sized railway sleepers and pressure impregnated posts.

b/ Excluding foresting operations.

c/ Excluding paper conversion plants and small factories producing less than 10 tons a day.

d/ Including veneers for matches.

/C. THE

C. THE PULP AND PAPER INDUSTRY

The pulp and paper industry comprises that group of industries which by chemical or mechanical processing of wood or other cellulose materials produces intermediate or final products, the most important of which is paper.

The only raw materials used by the industry in Chile are pinus insignis wood and, to a much smaller extent, waste products such as paper cuttings and used paper.

The industry has boomed since 1950, largely owing to the excellent properties of pinus insignis as a raw material. This tree was introduced experimentally into the country at the beginning of the century and began to be grown on a large scale in 1930, particularly in the province of Concepción from Linares in the North to Malleco in the South. About 15,000 hectares a year were planted in this region in 1937-49, and it now has a total of over 300,000 hectares of plantations accessible for industrial use.

Pinus insignis' advantages as a raw material for pulp and paper manufacture include its rapid growth, about 5 or 6 times faster than that of similar species in the Scandinavian countries, and its length of fibre, which makes for very strong paper. Its exploitation is facilitated by the accessibility and concentration of its plantations.

In order to ensure that the raw material resources needed for the industry's future growth will be available, the Government is carrying out a reforestation plan under which 50,000 hectares a year of pinus insignis are to be planted by 1970.

Chile also has natural resources for the other raw materials of the industry - sodium sulphate, lime, common salt, kaolin, etc. - of good quality and in practically unlimited quantities.

The pulp industry proper has an output of about 95,000 tons/year, of which 82,000 is crude kraft and bleached sulphate pulp and 13,000 crude sulphite pulp.

/Investment in

Investment in the kraft pulp plant, which is at Laja, was 22,890,000 dollars in 1959. That in the sulphite pulp plant, at Nacimiento, was estimated at about 20,000,000 dollars in 1963.

The pulp industry employs nearly 1,000 persons as factory operatives.

The destinations of the pulp produced vary considerably. The Nacimiento factory produces only for a neighbouring newsprint factory belonging to the same company. The Laja factory produces partly for a newsprint factory in Bío-Bío belonging to the same company, which consumes nearly 10,000 tons/year of kraft and semi-bleached pulp, exports about 15,000 tons/year (in 1963 2,231 tons of bleached pulp, 4,392 of semi-bleached and 7,866 of crude pulp), and in 1963 had a surplus of 57,000 tons which was absorbed by other domestic paper and paperboard plants.

Chile accounts for only 0.2 per cent of total world pulp output (45 million tons in 1963), but is rapidly gaining a dominant position among the Latin American producers. From nothing in 1950, its output was 80,000 tons in 1960 and is expected to reach at least 400,000 tons in 1970, by which year it will have become the major pulp producer and exporter of the region.

The Chilean paper industry has been developing steadily since the twenties and thirties and is now able to satisfy almost all of domestic demand and even export considerable volumes of newsprint. It is almost entirely in the hands of a single company (Compañía Manufacturera de Papeles y Cartones S.A.) which satisfies over 90 per cent of domestic demand. There are a few smaller companies, such as Schorr and Concha de Talca, which produce packing and similar types of paper, and Cartón El Salto of Viña del Mar, which produces paperboard and duplex bristol board, and about twenty very small factories producing paperboard and packing paper from used paper and paper cuttings.

There are also two new factories. One, Industrias Forestales S.A., has capacity for 60,000 tons/year of newsprint, but is bound to export its output, since its machinery was imported under the exemptions established by Decree-Law 256 for export industries only. The other

/- Papelera del

- Papelera dal Pacifico, at San Francisco de Mostazal - is to begin production half-way through 1965 and will specifically supply special papers such as sulphurized, colqwal, curokot, gummed paper, etc. Its projected capacity is 15,000 tons/year. Lastly, a recently formed company, Laja Crown S.A., is to set up operations near the Laja pulp factory in order to produce IBM bristol board (15,000 tons/year by 1970) and other kraft papers (21,000 tons/year) for the domestic and regional markets.

Chile's only paper imports are of special papers, including periodicals paper (6,211 tons in 1963) and a miscellany of other types imported in very diverse quantities (3,096 tons in all in 1963). With the new factories mentioned above there are prospects that these imports will be considerably reduced within the near future.

Since per capita consumption of paper has often been taken as an index of economic and cultural development, it is interesting to compare the changes that have occurred in this respect in different Latin American countries (table 35).

Table 35

LATIN AMERICA: PER CAPITA CONSUMPTION OF PAPER AND PAPERBOARD IN CERTAIN COUNTRIES

(Kilogrammes per inhabitant)

Country	1937	1954	1965 a/
Colombia	2.7	6.4	11.4
Mexico	5.8	9.2	18.1
Peru	3.0	6.6	8.5
Uruguay	12.7	21.0	28.4
Chile	8.6	15.3	14.7

a/ According to ECLA's demand projections.

/While Colombia's

While Colombia's and Mexico's per capita consumption increased considerably over the last decade, Chile's has stayed almost the same. In view of the economic development that did in fact take place in the decade this would appear to be due to reasons of a special order, among which high prices might be mentioned.

Table 36 shows Chile's kraft pulp output and foreign trade in the last few years.

Table 36

CHILE: KRAFT PULP OUTPUT AND FOREIGN TRADE

(Metric tons)

	1961	1962	1963
Production	78 348	84 036	82 854
Exports	30 700	22 528	14 489
Apparent consumption	47 648	61 508	68 365

Note: There were no imports of kraft pulp.

/D. THE

D. THE CHEMICAL INDUSTRY [32]

1. The chemical industry as a whole

(a) Relative importance in the economy

The figures of table 37 give an idea of the economic importance of the chemical industry relative to the economy as a whole and to industrial activity in general.

Table 37

CHILE: THE CHEMICAL INDUSTRY RELATIVE TO OTHER ECONOMIC ACTIVITIES, 1963

	Millions of 1950 escudos	Percentages	
Gross value added			
Economy as a whole	4 358.0	100	
Manufacturing industry	775.0	17.8	100
Chemical industry	41.3	0.95	5.3
Gross domestic product			
Economy as a whole	9 993.0	100	
Manufacturing industry	1 817.0	18.2	100
Chemical industry	96.8	0.97	5.3

These figures show that in Chile the chemical industry is very backward relative to the economy as a whole and the industrial sector. But just because of this, it may be hoped that, given the proper stimuli, it will have a very rapid initial growth.

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[32] By the chemical industry is here meant Major Group 31 of the United Nations International Standard Industrial Classification of All Economic Activities. The manufactures comprised in this major group are: basic industrial chemicals, including fertilizers; vegetable and animal oils and fats; paints, varnishes and lacquers; miscellaneous chemical products. The sub-divisions of these groups, which can be found in United Nations publication E/CN.12/648, are omitted here for the sake of clarity.

/(b) The

(b) The growth of the industry

The Ten-Year Development Programme for 1961-1970 set a target growth rate for the chemical industry of 8.2 per cent a year cumulative. During 1961-63, however, it achieved a rate of only 2.7 per cent a year, practically the same as the growth of the population.

In table 38 the growth targets set for different major groups of industry are compared with their actual growth rates in 1961-63. It may be observed that all the activities associated with basic consumptions (food, wearing apparel, housing) grew much more rapidly than the population and surpassed their targets.

Table 38

CHILE: DEVELOPMENT OF CERTAIN INDUSTRIES

Major group	Percentage annual growth planned for 1961-70	Actual percentage annual growth 1961-63
20. Food products	4.58	4.7
23. Textiles	4.15	10.1
24. Wearing apparel and footwear	4.26	7.6
31. Chemical products	8.20	2.7
32. Petroleum and coal products	9.12	13.4
34. Basic metal products	6.75	10.3
35 to 38. Metal and metallurgic products	9.05	b/
35. Metal products, except machinery and transport equipment	a/	20.6
37. Electrical machinery, apparatus, appliances and supplies	a/	3.2

a/ Percentages combined in the preceding item.

b/ Data not available.

/(c) Investments

(c) Investments

Extrapolation of the gross value of chemical production in 1963 according to the observed growth rates of 1961, 1962 and 1963 gives a gross value of 80.2 million 1958 escudos for 1966. The desired production increase of 12 per cent in 1967 will, therefore, involve immediate investment of funds capable of generating 9.6 million 1958 escudos.

It has been established that in Chile, under the present structure of the chemical industry, which may be expected to remain the same during the next few years, each escudo of fixed capital investment generates 1.5 escudos worth of chemical products. For the desired production increase in 1967, therefore, 6.4 million 1958 escudos will have to be invested, starting now (1965). In the following 10 years about 102.6 million 1958 escudos, roughly 100 million dollars, will have to be invested, each investment being made two years before the desired production increase.

25 per cent will have to be added to these sums to cover working capital.

30 per cent of the new fixed asset investments will be in hard currencies, for which the suppliers will be bound to obtain loans with fairly long periods of maturation (now 8 years under a Central Bank ruling). Thus, only 70 per cent of the value of the new assets will have to be financed domestically. The resulting financing in escudos needed for the next 10 years is shown in table 39.

The time for which a 12 per cent annual growth rate can be maintained will depend on many contingencies. However, even if it lasts for ten years it will only just more than double per capita chemical consumption, which is now a seventh of that in the European Common Market in 1957 and a tenth of that of the United States in the same year.

/Table 39

Table 39

CHILE: FINANCING OF THE DEVELOPMENT PROGRAMME FOR THE DOMESTIC CHEMICAL INDUSTRY

(Millions of 1958 escudos)

Year	Fixed assets	Working capital	Total domestic financing
1) 1965	4.5	-	4.5
2) 1966	5.0	-	5.0
3) 1967	5.6	1.6	7.2
4) 1968	6.3	1.8	8.1
5) 1969	7.1	2.0	9.1
6) 1970	7.9	2.2	10.2
7) 1971	8.9	2.5	11.4
8) 1972	9.9	2.8	12.7
9) 1973	11.1	3.2	14.3
10) 1974	12.4	4.4	16.9

(d) Raw materials

One of the obstacles to the development of the chemical industry often mentioned is the difficulty of obtaining its raw materials, particularly those which must be imported.

According to the Central Bank, imports already represented 8.7 per cent of the industry's total raw materials in 1962, 10.9 per cent in 1963 and 9.6 per cent in 1964. Consequently, in spite of the interest in promoting the chemical industry felt in the country, there is unlikely to be any improvement in the supply of imported raw materials, except in a few cases.

The prices to industrial consumers of the basic and intermediate raw materials produced domestically should gradually decrease as a result of the State taking part in their manufacture for promotion purposes. This will occur particularly in sulphuric acid, the basis of almost the whole industry, whose present prices are 3 or 4 times the domestic prices of the United States.

2. Sulphuric acid

The exact date on which sulphuric acid was first manufactured in Chile is unknown. At any rate, it was already being produced in 1884, since an industrialist was awarded a prize for his exhibit of it and other inorganic acids in the National Exhibition in October of that year.

Sulphuric acid is consumed in many productive activities. The distribution of its consumption in 1965 is estimated as follows:

Table 40

CHILE: USES OF SULPHURIC ACID, 1965

(Percentages)

1. Copper mining	75.04
2. Phosphorus fertilizers	5.01
3. Rayon	4.57
4. Scouring of iron and steel	3.11
5. Aluminium sulphate	2.90
6. Explosives	2.73
7. Petroleum	2.16
8. Detergents and sulphonated oils	1.40
9. Other uses	3.08
Total	100.00

Sulphuric acid output has grown spectacularly in the last 15 years, as can be seen from table 41. The figures given have been corrected in order to express the amounts in terms of the 98 per cent acid normally

Table 41

CHILE: SULPHURIC ACID PRODUCTION, INSTALLED CAPACITY AND PER CAPITA CONSUMPTION

Year	Production (tons/year)	Installed capacity (tons/day)	*Per capita* consumption (Kilogrammes/ inhabitant/year)
1951	10 920	90	1.76
1952	13 386	90	2.12
1953	15 452	90	2.40
1954	19 468	127	2.95
1955	42 115	152	6.22
1956	47 451	192	6.83
1957	50 465	192	7.08
1958	56 233	192	7.70
1959	73 576	237	9.85
1960	84 178	314	11.03
1961	116 907	414	15.06
1962	129 070	414	16.23
1963	136 000 a/	454	16.20
1964	178 000 a/	534	20.60
1965	193 000 a/	573	21.80
1966	...	638	...

a/ Estimate.

All the sulphuric acid consumed in Chile is domestically produced, since imports of it are forbidden. Small consignments have been exported to Bolivia from Antofagasta. The chief characteristics of the many producing plants of the country appear in table 42. The plants can operate normally at 20 per cent above the rated capacities there given.

Table 42

CHILE: DISTRIBUTION OF INSTALLED CAPACITY IN SULPHURIC ACID PLANTS

Province	Locality	Capacity (tons/day)	Process	Raw material
Tarapacá	Arica	15	Contact	Sulphur
Antofagasta	Chuquicamata	75	"	Pyrites
	Calama	10	"	Sulphur
	Mantos Blancos	120	"	"
	Antofagasta	60	"	"
	Paposo	50	"	"
Atacama	Copiapó	25	"	"
Coquimbo	La Serena	10	"	"
	Ovalle	15	"	"
Valparaíso	Quillota	10	"	"
	Concón	12	"	"
Santiago	Santiago	27	Chamber	"
	Llolleo	24	Contact	"
	San Antonio	10	"	"
O'Higgins	Caletones	75	"	Smelter gases
Concepción	Penco	40	"	Sulphur
	San Vicente	10	"	"

Two more plants are being built in the province of Atacama and will come into operation at the end of 1966.

Most of the plants have been properly used and maintained and give the normal outputs guaranteed by the manufacturers of their equipment.

Only 3 of the 17 described are engaged exclusively in producing for sale. The rest supply most of their output to a parent enterprise and sell only their surpluses.

The small capacities of the individual units result in high costs. Ex-factory prices at the end of 1965 ranged from 31.50 to 100 dollars a ton. In the industrialized countries, where the smallest units have capacities of over 50 tons/day and many exceed 100 tons/day, ex-factory prices c.i.f. are 25-30 dollars a ton.

Most of the plants were bought complete abroad. But CORFO has now successfully initiated the domestic manufacture of sulphuric acid equipment and only essential parts not produced in the country are imported. Imports now do not account for more than one-third of the total investment of a complete plant (including civil works).

In 1966 the industry underwent a crisis owing to a shortage of sulphur. Domestic production of this raw material is as yet insufficient and, since there is also a deficit in the international market, it is difficult to get abroad. It is hoped that the supply will improve in 1967, when CORFO's development programmes for sulphur production are carried out.

In view of sulphuric acid's essential role in economic development, CORFO is carrying out, through its affiliate FASSA (Fábrica de Acido Sulfúrico S.A.), a programme of building sulphuric acid plants throughout the country. This began with an expansion of the Antofagasta plant (built in 1956) to double capacity, which was ready for operation at the end of 1965, followed by the construction of a plant at Arica, which began production in March 1966. FASSA is building another plant at Vallenar, which will come into operation in December 1966, and may run the El Salado plant (Chañaral) now being built by ENAMI, which will be ready half-way through 1966.

Studies for a plant in the industrial zone (Santiago-Valparaíso) and further plants in the provinces are now under way.

/3. Projects

3. Projects for the manufacture of phosphorus fertilizers

(a) Market

Chile's 1963 consumption of phosphorus fertilizers was 77,000 tons of phosphoric anhydride (P_2O_5). CORFO's most recent projections of future consumption give 104,000 tons of P_2O_5 for 1968 and 136,000 for 1973. These do not take into account the effects of government measures to increase fertilizer use.

The ideal consumptions for the same years estimated by the ECLA/FAO Joint Agriculture Division are almost double the above, that is, 206,000 and 263,000 tons.

Considering the extent to which the normal growth of consumption would fall short of these ideal levels, it is obvious that they can only be attained in the short term by resolute government action. Their economic importance lies in the fact that increased use of fertilizers on this scale might result in a huge savings in the foreign exchange spent on imports of agricultural products - calculated at roughly 15 million dollars a year in 1968-73.

(b) Projects

At the moment there are three viable projects for the manufacture of phosphorus fertilizers, whose joint capacity would make the country self-sufficient by 1968:

(i) A calcium and magnesium phosphates factory to be installed at Valdivia, with a fixed investment of 9 million escudos and a production capacity of 12,000 tons of P_2O_5 a year.

(ii) A triple superphosphate factory to replace the present simple superphosphate factory at Penco, with an investment of somewhat over 3 million dollars and a production capacity of 46,000 tons of P_2O_5 a year.

(iii) A triple superphosphate factory to be installed at Rancagua, with an as yet unknown investment and a capacity of 50,000 tons of P_2O_5 a year.

(i) The Valdivia factory. This would produce calcium and magnesium phosphates with 20 per cent P_2O_5 content for local consumption by smelting imported phosphate rock and serpentine from quarries near Valdivia in

This fertilizer would be dearer per phosphorus unit than the imported triple superphosphate sold at Valdivia, but it is considered that its magnesium content and alkaline nature would justify a price as much as 20 per cent higher.

The ways in which this manufacture can give a reasonable rate of return without exceeding the price limit mentioned are still being studied.

CORFO would provide 15 per cent of the share capital of this project and would help the enterprise concerned to obtain the loans needed for its installation.

If there are no delays over its financing the factory could begin production at the beginning of 1958.

(ii) The Penco factory. The simple superphosphate plant at Penco is to be converted for the manufacture of granulated triple superphosphate from imported phosphate rock and domestic or imported sulphur, according to the price situation and the supplies available on the world market.

The railhead cost of the product packed in 80 kilogramme polyethylene-lined jute sacks is estimated at 71 dollars a metric ton as against a minimum of 82 dollars a ton for the imported product under similar conditions.

The lower cost of the fertilizer produced at Penco would enable the enterprise, if it sold it at the price of its imported equivalent, to make a 15 per cent net profit in hard currency on the total investment in the new plant.

CORFO will take a 15 per cent share in this enterprise also, will help obtain the financing for the new investments on the easiest terms and will guarantee the loans obtained.

The factory will come into production 14 months after the works have begun; it is expected to be in operation by the beginning of 1968.

(iii) The Rancagua factory. From the figures given above it appears that, even if no extreme measures are taken to increase consumption, there will be deficit of 50,000 tons of phosphoric anhydride in 1968. Consequently, a second triple superphosphate plant of 50,000 tons/year of P O will have

Studies commissioned by CORFO show that production at Rancagua, using sulphuric acid from Caletones, would be cheaper than at Concepción by enough to compensate for the increased costs of transporting the product to the consumption centres of Centre-South.

The use of gases from Caletones would also give the plant a supply of acid at a constant price that would be unaffected by the situation on the world sulphur market and would enable it to spend 1,500,000 dollars less a year in foreign exchange than the Penco plant, which will mostly use imported sulphur.

In view of these advantages, the possibility of immediately beginning negotiations for installing the plant is being considered. Its construction will be co-ordinated with expansion works on the Caletones foundry.

4. The present position and future prospects of the petrochemical industry

(a) General remarks

The Chilean chemical industry's overall contribution to the gross domestic product is only 1 per cent and to the gross production value of the Latin American chemical industry less than 4 per cent (not including nitrates).

Its growth rate in 1959-62 was 4.7 per cent a year cumulative and in 1961-63 only 2.7 per cent, as against 12 to 14 per cent in Argentina, Brazil and Mexico.

Thus, the industry as yet has little importance in the national economy and recently has not grown faster than the population.

Chile's petrochemical industry at present comprises only the manufacture of certain final products from raw materials that are almost all imported. The products are as follows: alkyd resins, unsaturated polyester resins, phenol-formaldehyde resins, urea-formaldehyde resins, vinyl emulsions, benzene, toluene and xylenes from refinery gas, flexible polyurethane, formaldehyde, pentaerythritol, urea-based moulding powders,[*] melamine resins.[*]

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[*] The plants are still being built, but are to begin productio

The total volume of production of petrochemical products is about 18,000 tons/year and the total value about 24 million escudos a year. The largest outputs are of formaldehyde in 37 per cent solution (3,500 tons/year), urea-formaldehyde resins (3,000 tons/year), alkyd resins (2,500 tons/year) and polyester resins (2,000 tons/year).

With the expansions projected and the new plants under construction, the total volume of production should be about 42,000 tons/year in 1970 and its total value, at present prices, about 40 million escudos a year. The largest outputs will then be of formaldehyde in 37 per cent solution (10,000 tons/year), urea-formaldehyde resins (6,000 tons/year), melamine-formaldehyde moulding powders (4,000 tons/year), pentaerythritol (3,000 tons/year), urea-formaldehyde moulding powders (3,000 tons/year). There will also be a new product manufactured - phthalic anhydride (2,000 tons/year, worth about 2,700,000 escudos).

At present about 150 persons, including technicians and workers, are employed in the manufacture of these products. By 1970 the number will be about 300.

The technology used for most of the products is up-to-date. In some cases it is used under license and with payment of royalties. The basic equipment of the industry is imported, but unspecialized equipment such as tanks, simple columns, standard pumps, motors, standard piping, etc. is domestically produced.

(b) Development programme for the Chilean petrochemical industry

The preliminary work for the installation of a full-scale petrochemical industry in Chile - itself decisive for the activation of the now stagnant chemical industry - is in the hands of CORFO and its affiliate the Empresa Nacional del Petróleo (ENAP).

This work may be summarized as follows:

(i) Studies of the technical and economic feasibility of the petrochemical complexes that seem suitable for Chile.

(ii) Formulation of a development policy for the industry, in order to co-ordinate the efforts of the different private and state sectors interested in developing it.

(iii) Selection of the processes and technologies most suited to local conditions.

(iv) Investigation of prospective export markets for some of the future petrochemical productions, with particular reference to the LAFTA countries.

(v) The installation of the basic petrochemical industry, i.e. the industry which will manufacture the basic raw materials for different petrochemical complexes and satellite plants, in accordance with a pre-established programme.

(vi) Promotion of the installation of petrochemical complexes and satellite plants. This promotion essentially consists in the creation of conditions that will attract private investors to the industry in a manner conforming to technical planning requirements and with state partnership when this is conducive to integral and balanced development.

(c) Petrochemical complexes

From the information available it appears that the programme for the development of the industry during the next 5 or 6 years will involve, for a start, the installation of the following complexes:

(i) Ethylene complex. Chief units:

Naphtha cracking plant for ethylene:

Initial capacity: about 30,000 tons/year of high-purity ethylene.

Main by-products: propane-propylene, butane-butylenes-butadiene, methane-hydrogen, gasoline by pyrolisis.

Electrolytic chlorine-caustic soda plant:

Initial capacity: 20,000 tons/year of chlorine.

Main by-products: caustic soda in 50 per cent solution, hydrochloric acid.

Monomer and polymer (PVC) vinyl chloride plants:

Initial capacity: 15,000 tons/year of PVC in its main types.

Main by-product: ethylene dichloride.

High-pressure polyethylene plant:

Initial capacity: 15,000 tons/year of polyethylene in its main types.

The total plant investment of this complex will be about 25 million dollars in foreign exchange and local currency.

(ii) Ammonia complex. Initial units:

Plant for production of ammonia by reformation of natural gas with water vapor:

Initial capacity: 1,000 tons/day of anhydrous ammonia.

Main by-product: carbon dioxide.

Nitric acid and ammonium nitrate plant:

Minimum initial capacity: 100 tons/day of granulated ammonium nitrate.

Urea plant:

Minimum initial capacity: 91 tons/day of urea crystals and powders.

The complex might also include a methanol plant.

Its minimum plant investment will be about 30 million dollars.

(iii) Aromatic residues complex. Units:

Reformation, extraction and separation plant for benzene, toluene and the xylenes.

Phthalic anhydride plant.

Phthalic plasticisers plant.

Terephthalic acid and/or dimethyl terephthalate plant.

Cyclohexane, caprolactam, monomer styrene and other plants might be included, if circumstances justify.

The initial capacities and some of the sequences and processes have not yet been determined. However, the total plant investment involved will be at least 30 million dollars in foreign exchange and local currency.

(iv) Acetaldehyde complex. Units:

Acetaldehyde plant.

Vinyl acetate plant.

Acetic anhydride plant.

Higher industrial alcohols plant.

As in the preceding case, the initial capacities of this complex have not been exactly determined. However, the total investment involved will be not less than 25 million dollars

To sum up, the petrochemical development programme will involve an investment in new plants of around 120 million dollars in 1966-1970.

The effects on the balance of payments of the installation of the complexes described are shown in table 43. It there appears that the foreign exchange investment needed for each plant will be recovered in an average of two years after it has begun production.

About 900 persons, including technicians and workers, will be employed in the manufacture of the products mentioned.

Table 43

CHILE: PETROCHEMICAL PROGRAMME, ESTIMATED FOREIGN EXCHANGE SAVINGS AND/OR EARNINGS

(Base year, 1970)

Petrochemical complex	Imports		Import substitution (million dollars)	Exports (million dollars)	Foreign component in production costs (million dollars)	Foreign exchange savings or earnings a/ (million dollars)	Time of recovery of the foreign component (years)
	Million dollars	Million escudos					
I. Ethylene complex	15.0	38.0	9.9	-	1.9	8.0	1.9
II. Ammonia complex	18.0	46.0	5.4	7.5	1.7	11.2	1.6
III. Aromatic residues comp.	20.0	61.0	10.0	10.0	5.5	14.5	1.4
IV. Acetaldehyde complex	15.0	38.0	5.5	14.0 b/	12.5 c/	7.0	2.1
Totals	68.0	183.0	30.8	31.5	21.6	40.7	1.7 (average)

a/ Not including amortization of the imported component.

b/ Includes exports of all the aldehyde produced.

c/ Includes imports of basic inputs from LAFTA countries (estimated value).

/E. THE

E. THE PETROLEUM INDUSTRY

1. General remarks

In June 1950 the Empresa Nacional de Petróleo (ENAP) - an affiliate of CORFO - was created by Law N° 9,618.

According to the text of the law and its own statutes, ENAP was to exercise all the functions and rights of the State with regard to the exploration and exploitation of petroleum deposits and the refining and sale of the petroleum obtained from them and its products and by-products. In this capacity it was to build, instal, purchase and operate plants for the treatment, transformation, refining and use of petroleum, its products and by-products. It began, therefore, to train the technical personnel it needed, draw up working plants, step up drilling operations, carry out production installations and plan processing and recovery plants that would allow a full-scale exploitation of petroleum, natural gas and their products.

By 1952 it was able to open a gasoline plant at Cerro Manantiales to supply the fuel needs of the province of Magallanes. In 1954 a refinery at Concón was finished and began to operate normally. In 1958 this refinery was expanded and began to satisfy most of domestic fuel needs. In 1962 a plant at Cullén, Tierra del Fuego, came into operation and in 1963 the engineering work on a refinery at Concepción began. In June 1965 ENAP's board approved the construction of an ethylene plant, which will be the basis of the first petrochemical complex.

As is inherent in this industry, ENAP has had to undertake a whole series of activities such as the building of roads, oil pipelines, gas pipelines, pumping stations, camps, housing, workshops, airfields, marine terminals, etc.

ENAP's starting capital was 876,000 escudos. It is now 320 million escudos. Its last published balance (1964) showed a profit of 42 million escudos.

/2. Refineries

2. Refineries and plants

CORFO's first concern, particularly after the discovery of the Manantiales deposit, as also ENAP's, when it had taken charge of the industry, was to give the country the refineries and plants that would enable the recently discovered raw material to be processed. The first to come into operation was the Manantiales gasoline plant (1952), which processes natural gas, stabilizes crude petroleum and maintains pressure in the deposits. Its original processing capacity was 850,000 cubic metres of gas a day, now raised to 1,400,000 cubic metres a day. It supplies all the motor vehicle gasoline, kerosene, diesel oil and liquid gas needed by the province of Magallanes. In 1962 a plant that produces propane, butane and natural gasoline from natural gas came into operation at the Cullén deposit. Its processing capacity is 2,800,000 cubic metres of gas a day. The liquid gas produced by the Manantiales and Cullén plants is partly consumed in Magallanes, partly sent up North where, combined with the production of the Concón refinery, it satisfies the whole of domestic demand, and partly exported.

The Concón refinery was officially inaugurated at the end of 1955. Like the plants mentioned above, it was built by Chilean technicians and workers. Its initial processing capacity was 3,200 cubic metres of crude petroleum a day, which was expanded in 1959 to 7,000 cubic metres a day. It now has cracking, catalytic reformation and alkylation units that enable it to produce high-octane gasoline for motor vehicles and aircraft, fuels such as kerosene, diesel oil and fuel oil, and a number of solvents.

At the end of 1962 work began on a further refinery at Concepción. It will have capacity for 5,700 cubic metres of crude petroleum a day and will include distilling and vacuum, catalytic cracking, viscosity reducing and catalytic reformation units. It is expected to come into operation in 1966. The two refineries combined will be able to satisfy the whole of domestic consumption of gasoline, kerosene and diesel oil until 1970.

The Lummus Company is now designing an ethylene plant for Chile with a capacity of 30,000 tons/year, which is expected to come into operation at the end of 1967. This will provide the raw material for the manufacture of the plastic domestically used.

/3. Production

3. Production

Table 44 shows the evolution of domestic production of crude petroleum and natural gas since it started.

Table 44

CHILE: TOTAL PRODUCTION OF CRUDE PETROLEUM AND NATURAL GAS

(Thousand cubic metres)

Year	Crude petroleum	Natural gas
1949	9	4
1950	100	200
1951	121	143
1952	145	92
1953	200	280
1954	276	387
1955	410	466
1956	563	587
1957	690	796
1958	885	1 336
1959	1 022	1 815
1960	1 150	2 194
1961	1 473	2 549
1962	1 858	3 560
1963	2 099	5 155
1964	2 176	6 281

In 1965 2,746,490 cubic metres of crude, of which 785,100 cubic metres were imported from Venezuela, and 6,214,650 cubic metres of natural gas were processed. Approximately 40,000 cubic metres of natural gas were exported to Argentina and Brazil.

/Output of

Output of refined products in that year was as shown in table 45.

Table 45

CHILE: NET OUTPUT OF REFINED PRODUCTS IN JANUARY-SEPTEMBER 1965 a/

Product	Cubic metres	Product	Cubic metres
Light products		Heavy products	
Standard gasoline	675 480	Fuel oil Nº 5	152 770
Special gasoline	88 500	Fuel oil Nº 6	305 930
Aviation gasoline 80/87	4 230		
Aviation gasoline 100/130	27 510		
Aviation gasoline 115/145	2 120		
Kerosene	222 620		
Diesel oil	364 780		
Liquid gas	317 090		
Solvents		Other products	
Liquid petrolatum	2 450	Reformation hydrogen	70
Painters' naphtha	10 820	Gas oil	1 320
Solvent naphtha Nº 3	2 730	Liquid fuel oil	4 010
Solvent naphtha Nº 4	200	Industrial naphtha	360
Solvent naphtha Nº 7	70	Non-sulphonable diesel oil	30
Reformation solvent	160		

a/ Excluding ENAP's internal consumption.

The figures given include the outputs of the gasoline plants and of the Concón refinery. In addition, 67,280 cubic metres of propane and 20,620 cubic metres of butane were produced in Magallanes during the period.

The output of refined products is expected to increase by about 8 or 9 per cent a year in future, depending on consumption.

4. Employment and manpower productivity

ENAP's total personnel in 1965 was as follows:

Table 46

CHILE: PERSONNEL EMPLOYED BY ENAP

Location	Staff	Workers
Santiago	169	18
Concón	576	439
Concepción	149	163
Puerto Varas	9	62
Magallanes	779	1 191
Total	1 682	1 923

By and large, ENAP's technology, operating conditions, manpower productivity, etc. are slightly inferior to the average in the United States petroleum industry, but certainly better than those of any state company in other countries.

The sales prices of the refined products are similar to their international prices plus internment dues.

The development of the industry depends primarily on the evolution of domestic consumption of refined products and on the prospection and discovery of new petroleum and natural gas reserves. If large enough reserves of the latter are found, new plants might be built for the production of liquid gas for export.

/F. THE

F. THE METAL-TRANSFORMING INDUSTRIES

1. Apparent consumption, production and imports

The metal-transforming industries have contributed enormously to the development of the manufacturing sector in Chile. In 1957 they accounted for 10.8 per cent and in 1964 for as much as 17.0 per cent of the industrial value added.

Table 47

CHILE: GROSS DOMESTIC PRODUCT OF THE METAL-TRANSFORMING INDUSTRIES, AT MARKET PRICES

(Millions of 1957 escudos)

Years	Metal-transforming industries A	Manufacturing industry B	Percentage $\frac{A}{B} \times 100$
1957	61.3	566.6	10.8
1958	62.6	577.9	10.8
1959	78.0	546.8	14.3
1960	72.2	563.8	12.8
1961	73.5	550.7	13.3
1962	86.9	580.8	15.0
1963	95.5	595.5	16.0
1964	111.0	654.4	17.0

Taking 1957 as base (= 100) and assuming a constant currency, in 1964 the value added by the metal-transforming sector was 181, that of manufacturing industry 115.5 and that of the economy as a whole 128.3.

The gross value of metal-transforming production rose from 114.8 million escudos in 1957 to 210.8 million in 1964 (escudos of 1957), which gives an 83.6 per cent increase for the period (slightly larger than the increase in the product of the sector). It is hoped that by 1970 it will have reached 261.8 million 1957 escudos.

/The fastest

The fastest growths have been in group 34,* basic metals, and group 35,* metal products. The former includes the iron and steel industry which, from its special nature and importance, will be analysed separately.

Table 48 shows the growth of physical output in certain specific headings.

Table 48

CHILE: PHYSICAL OUTPUT INDICES FOR CERTAIN PRODUCTS OF THE METAL-TRANSFORMING INDUSTRIES

Products	1961	1962	1963	1964	1965 a/
Steel for rolling	100	132	132	147	160
Cast-steel parts	100	106	108	128	155
Steel parts for railways (axles, wheel rims and bogies)	100	155	104	67	100
Wire and nails	100	151	164	228	253
Screws and similar products	100	123	149	130	164
Piping and tubes	100	115	133	174	156
Wrought tools	100	106	120	110	114
Enamelled iron kitchen ware	100	108	102	106	107
Steel spades	100	126	87	117	120
Tin-plated containers	100	130	120	134	136
- Preserves	100	141	129	154	162
- Miscellaneous uses	100	107	107	116	123
- Milk and dry products	100	135	118	118	108
Steel containers (drums, buckets, etc.)	100	150	134	150	159
Cylinders for liquid gas	100	212	171	188	190
Electric motors b/	100	156	222	351	441
Electric welders	100	115	94	112	118
Domestic appliances					
- Refrigerators	100	133	193	203	288
- Electric washing machines	100	123	157	212	279
- Gas and electric water heaters	100	157	200	191	172
- Gas and electric cooking stoves	100	128	163	155	199

Source: Chilean Steel Institute (ICHA).

a/ The figures for the second half of the year are estimates by the firms themselves.

b/ Includes only motors sold as such by the manufacturers, not those that form part of appliances produced by the same manufacturer.

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* Major groups of the United Nations International Standard Classification of All Economic Activities.

/Considerable advances

Considerable advances were made in the physical output of almost all the products listed in the table.

The situation in foreign trade of metal-transforming products is, however, highly unfavourable. In the last eight years imports averaged over 230 million dollars a year, or nearly half total imports, and exports barely 20 million a year, or less than 5 per cent of total exports. There is, thus, ample room for import substitution in the sector, particularly of machinery, apparatus, tools and transport material.

2. The iron and steel industry

Apparent consumption of steel products has averaged over 500,000 metric tons/year of steel ingots over the last seven years, and in 1964 was over 727,000 tons. Between the first and last of these years, 1958 and 1964, it grew by over 340,000 metric tons, or almost 89 per cent (see table 52).

Domestic production has grown at a rate similar to that of apparent consumption. It began in the years preceding the Second World War and during the thirties and forties reached levels ranging from 20,000 to 44,000 tons. It was then carried out by four enterprises, which manufactured chiefly bars and small shapes and some of which had re-rolling mills for basic product and rail raw material.

When the Steel Company of the Pacific (Compañía de Acero del Pacífico - CAP) began its operations one of these enterprises shut down and one merged with it.

In 1950 a new integrated plant producing a broad range of products came into operation. Since then domestic production has shown a constant increase, reaching 420,000 tons of finished products, the equivalent of 600,000 metric tons of ingots, in 1964.

This output is achieved by maximum use of the existing installations, in which considerable technological changes have been made in order to increase their productivity. However, since domestic consumption continues to grow and there are now prospects of exporting to other Latin American countries whose own outputs are insufficient, the Company has begun expansion works that will increase annual output to 1,000,000 metric tons of steel ingots in the next three years, which is expected to give over 800,000 tons/year of rolled products.

/Imports of

Imports of rolled products have fluctuated considerably, but have shown an overall downward trend. They consist mostly of products not manufactured domestically, in particular special steels, seamless tubes and other products of unusual dimensions or properties.

Even though imports have been fairly large in absolute terms, their share in supply has been decreasing notably. Thus, they represented 31 per cent of total consumption of rolled products in 1955, 25 per cent in 1956-60 and only 10 per cent in the last four years (table 50).

Exports of iron and steel products have also fluctuated, because they consisted of surpluses that did not find a sale on the domestic market. They have shown an overall decline of the same magnitude as the increase in domestic demand (table 51).

Table 53 shows the distribution of iron and steel products sold on the domestic market by sectors of final use. The largest consumers are the industrial and construction sectors.

Projection of the apparent consumption of iron and steel products by correlating it with the national income (assumed to grow by 5.5 per cent a year) gives a figure of over 1 million metric tons of ingots for 1970 and over 1,700,000 for 1975.

3. Present characteristics of the metal-transforming industries

In 1964 the metal-transforming industries employed almost 60,000 persons, over 19,000 or 48 per cent more than in 1957.

A study made in 1961 showed that about 85 per cent of the employees were workers, the rest being staff.

On average 30 per cent of the workers engaged in production tasks were trained. However, the percentage varied greatly over the different groups. In group 37,[*] manufacture of electrical machinery, apparatus, appliances and supplies, it was only 17 per cent but in group 36,[*] manufacture of machinery, except electrical machinery, it was 41 per cent.

55 per cent of the workers employed in the maintenance departments were trained.

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[*] Major groups of the United Nations International Standard Classification of All Economic Activities.

The overall (average) composition of the industries' lower-grade personnel was: 29 per cent skilled workers, 26 per cent semi-skilled workers, 25 per cent assistants and foremen, 14 per cent day-labourers and 6 per cent service personnel. Of staff, 68 per cent belonged to the administration, accounting, sales and services departments, 4 per cent were engineers, 11 per cent technicians and 17 per cent prácticos (graduates from industrial schools).

In 1957, the last year for which there are census data, the size distribution of the sector by number of employees was as follows: 66 per cent of the enterprises employed 5 to 19 persons, 27 per cent 20 to 100 persons, and 7 per cent over 100 persons. Thus, small enterprises still predominate.

Only 52 per cent of the industries' equipment in 1960 was over 10 years old, as against 60 per cent in the United States. They are, therefore, relatively up-to-date in this respect.

4. Analysis of cost factors

The production costs of manufacturing industries depend primarily on their rate of use of their capital (real property, financial capital and equipment), labour costs and raw material costs, to a secondary extent on their energy, fuel, lubricant and accessory material inputs, and to a certain extent on such factors as tax liabilities, import duties, service costs, rents, interest payments, etc.

The chief cost element in the Chilean metal-transforming industries is as a rule their raw materials. There follow, in order of importance: compensations to personnel, profits and other expenses, taxes, energy, fuels and lubricants, and interest payments (table 74).

/Table 49

Table 49

CHILE: OUTPUT OF THE IRON AND STEEL INDUSTRY

(In tons of finished products)

Products	1951	1955	1960	1964
Pig iron	220 202	227 434	265 950	437 076
Ingots	195 340	314 022	452 594	574 958
Semi-finished products	152 200	268 942	354 477	473 524
Bars	81 660	123 790	124 808	185 548
Shapes	-	-	7 488	11 806
Axles	6 077	12 316	12 064	a/
Thick plates	19 316	31 917	48 241	51 955
Thin plates	11 096	36 163	59 136	98 881
Galvanized plates	9 268	13 712	18 463	41 572
Tin plate	12 047	17 780	14 725	26 990
Tubes less than 300 mm diameter	3 801	2 385	5 350	9 828
Tubes over 300 mm diameter			3 128	
Structures, etc.	5 000	4 019	5 175	-
Culvert sewers	-	4 465	811	-
Adjustment for internal consumption		(7 760)	(15 681)	(21 691)
Semi-finished products				13 182
Total finished products	148 265	238 787	283 708	418 076

Sources: Steel Company of the Pacific (CAP), INDAC S.A. Establecimientos Metalúrgicos and Factory of Materials for the Army (FAMAE).

a/ Included in thin plates.

/Table 50

Table 50

CHILE: IMPORTS OF IRON AND STEEL PRODUCTS

(In tons of products)

Products	1951	1955	1960	1964
Bars for concrete	1 496	-	3 108	1 630
Bars for other uses	14 634	12 943	6 187	2 303
Light shapes	1 665	3 000	2 563	499
Wire rod and wire	12 058	3 053	3 301	3 828
Heavy shapes	4 681	2 153	7 562	16 381
Rails and rail track accessories	26 232	7 233	11 208	36 071
Semi-finished ingots	1 006	505	188	52
Steel rails for mills	6 866	12 274	13 941	81
Special steels	705	327	860	1 064
Plates 4.75 mm thick or over	503	30	287	201
Sheets less than 4.75 mm thick	2 756	1 476	3 936	3 674
Tin plate	1 534	264	1 822	179
Unspecified plates	4 931	3 078	501	688
Seamless steel tubes	4 223	6 202	3 089	11 509
Seamed steel tubes	6 335	9 303	3 034	23 203
Unspecified tubes	-	-	1 705	175
Total steel products	89 625	61 841	63 292	101 538
Armour-plating for ore crushers	2 780	1 564	1 270	884
Cast tubes	4 445	680	1 523	402
Fittings and accessories for piping	1 487	1 112	479	8 873
Total	98 337	65 197	66 564	111 697

/Table 51

Table 51

CHILE: EXPORTS OF IRON AND STEEL PRODUCTS

(In tons of products)

Products	1951	1955	1960	1964
Bars for concrete	5 605	13 504	25 724	380
Bars for other uses	-	3 672	5 681	-
Light shapes	-	345	-	-
Wire and wire rod	587	150	4 698	-
Heavy shapes	-	-	-	-
Rails and rail track accessories	16	-	-	1 440
Ingots and semi-finished products	-	-	-	2 995
Plates 4.75 mm thick or over	3 466	12 000	10 000	-
Sheets less than 4.75 mm thick	8	12 795	52 269	16 167
Tin plate	-	-	-	-
Unspecified plates	-	-	-	-
Seamless tubes	750	-	7	-
Total steel products	10 432	42 466	98 379	20 982
Pig iron ingots	39 151	-	300	-
Total	49 583	42 466	98 679	20 982

/Table 52

Table 52

CHILE: APPARENT CONSUMPTION OF IRON AND STEEL PRODUCTS

(In tons of finished products)

Products	1951	1955	1960	1964
Bars for concrete	47 878	63 767	40 030	99 708
Bars for other uses	27 870	23 093	38 203	55 952
Light shapes	1 665	9 494	10 051	5 253
Wire rod and wire	27 908	28 761	23 068	50 436
Heavy shapes	9 681	6 172	12 737	16 381
Rails and rail track accesories	26 216	7 223	11 208	34 631
Ingots and semi-finished products	22 217	13 633	17 746	10 239
Steel balls for mills	6 866	12 274	13 941	81
Special steels	705	327	860	1 064
Sub-total for non-flat products	171 006	164 744	167 844	273 745
Plates 4.75 mm thick or over	16 353	19 947	38 528	52 156
Sheets less than 4.75 mm thick	29 189	51 318	42 141	127 965
Tin plate	13 581	18 044	16 547	27 169
Unspecified plates	4 931	3 078	501	688
Sub-total for flat products	64 054	92 387	97 717	207 978
Seamed steel tubes	7 274	8 587	11 560	21 337
Seamless steel tubes	6 335	9 303	3 034	23 203
Unspecified steel tubes	-	-	1 705	175
Sub-total for tubes	13 609	17 890	16 299	44 715
Total steel products	248 669	275 021	281 860	526 438
Pig iron ingots	29 668	11 730	514	8 708
Armour plating for ore grinders	2 780	1 564	1 270	884
Cast tubes	4 445	680	1 523	402
Fittings and accessories for piping	1 487	1 112	479	8 873
Total	287 041	290 107	285 646	545 305

/Table 53

Table 53

CHILE: APPARENT CONSUMPTION OF IRON AND STEEL PRODUCTS BY SECTORS OF USE

(In tons of ingots)

Sectors	1958	1960	1962	1964
Agriculture	492	167	408	468
Construction	92 377	72 564	124 791	130 285
Industry	88 304	133 236	219 677	275 145
Transport	36 508	56 225	86 650	84 141
Mining	74 278	75 007	60 176	57 400
Petroleum	18 774	10 020	5 368	36 820
Hardware shops and use unknown	74 901	41 307	131 547	142 815
Total	385 634	388 526	628 617	727 074

Table 54

CHILE: GROSS PRODUCTION VALUE OF THE METAL-TRANSFORMING INDUSTRIES

(In thousands of 1957 escudos)

Years	Group 34 a/ Basic metals	Group 35 a/ Metal products	Group 36 a/ Machinery (excluding electrical machinery)	Group 37 a/ Electrical machinery, apparatus, appliances, supplies	Group 38 a/ Transport material	Sectoral total
1957	64 531	22 351	8 363	8 002	11 515	114 762
1958	63 885	23 469	11 541	9 116	9 788	117 799
1959	85 374	28 319	10 922	10 337	12 666	147 618
1960	72 919	29 347	10 286	11 164	13 242	136 958
1961	68 531	37 103	9 534	11 925	12 090	139 183
1962	91 311	42 601	8 614	12 201	10 018	164 745
1963	98 086	51 340	10 454	12 569	9 212	181 661
1964	124 268	53 500	11 500	12 500	9 000	210 768

a/ Major groups of the United Nations International Standard Industrial Classification of All Economic Activities.

/Table 55

Table 55

CHILE: PROJECTIONS OF THE METAL-TRANSFORMING SECTOR

(Thousands of 1957 escudos)

Years	Value of production a/	Gross value added b/
1965	199 822	114 947
1966	213 011	124 180
1967	226 938	133 855
1968	241 692	144 027
1969	251 714	151 359
1970	261 752	158 701

a/ The figures projected result from the equation of regression with some modifications to allow for the steel enterprises' production programmes.

b/ The concept of the gross value added is used because it is impossible to calculate depreciation on the information available.

/Table 56

Table 56

CHILE: IMPORTS OF METAL PRODUCTS

(Thousands of dollars)

Tariff section	1957	1958	1960	1961	1963	1964
Section X a/ Metallurgic products	27 814	32 871	31 708	36 496	31 477	43 240
Section XI a/ Machinery, equipment and tools	104 408	104 863	104 238	132 962	152 735	157 702
Section XII a/ Transport material and equipment	84 307	55 386	77 267	115 129	74 883	74 196
Total	216 529	193 120	213 213	283 987	259 095	275 078

Source: Anuarios de Comercio Exterior, Customs Superintendency.

a/ Section X comprises:

Group 54: Iron and steel

Group 55: Other rolled and cast metals and their alloys

Group 56: Metal materials for unspecified uses

Group 57: Iron and steel artefacts

Group 58: Artefacts of other metals

Section XI comprises:

Group 59: Mining machinery, apparatus, equipment and tools

Group 60: *Idem* for agriculture

Group 61: *Idem* for industries and trades

Group 62: Driving engines, boilers and their spare parts

Group 63: Electrical machinery, apparatus and supplies

Section XII comprises:

Group 64: Machinery, equipment and materials for railways and tramways

Group 65: Marine craft and equipment

Group 66: Vehicles unspecified and their spare parts

/Table 57

Table 57

CHILE: EXPORTS OF METAL PRODUCTS

(Thousands of dollars)

	1957	1958	1960	1961	1963	1964
Section X a/						
Metallurgic products	20 156	25 613	18 406	13 326	5 975	38 227
Section XI a/						
Machinery, equipment and tools	675	274	415	2 147	645	1 345
Section XII a/						
Transport material and equipment	434	143	214	904	354	1 598
Total	21 265	26 030	19 035	16 377	6 974	41 170

Source: Anuarios de Comercio Exterior, Customs Superintendency.

a/ See preceding table.

/Table 58

Table 58

CHILE: BASIC DATA ON THE METAL-TRANSFORMING INDUSTRIES, BY TYPES OF INDUSTRIES, a/ 1957

Type of industry	Nº of establishments	Average employment	Salaries and wages (100 escudos)	Motor power installed (HP)	New investments (100 escudos)	Current expenditure (100 escudos)	Income (100 escudos)	Value added (100 escudos)
34	87	11 447	72 176.8	127 363	168 748	327 926	580 254	330 156
341	56	9 246	59 387.9	104 877	161 015	270 490	481 194	282 950
342	31	2 201	12 788.9	22 486	7 733	57 436	99 060	47 206
35	312	12 839	46 628.5	34 106	9 936	111 382	215 927	123 312
36	181	4 874	19 217.9	7 512	5 184	37 101	82 462	51 564
37	80	3 236	14 511.8	2 370	2 237	36 549	76 604	50 328
38	241	6 949	27 879.8	6 934	3 877	47 883	114 624	71 153
381	13	979	4 245.9	932	91	3 069	13 805	10 795
382	7	1 456	4 684.7	2 977	1 290	4 491	18 236	14 824
383	26	661	2 258.9	684	741	3 832	9 354	6 002
384	176	3 233	12 348.3	1 381	378	33 820	64 570	32 677
385	11	136	377.7	143	200	1 242	2 248	1 119
386	1	434	3 890.1	764	1 150	1 299	6 082	5 520
389	7	50	74.2	53	27	130	329	216

Source: Third National Census of Manufactures, Statistics and Censuses Department, Ministry of Economic Affairs.

a/ According to the United Nations International Standard Industrial Classification of all Economic Activities.

Table 59

CHILE: COST FACTORS IN PRODUCTION OF METAL PRODUCTS, 1961

(In percentages of the production value: sample figures)

Factors	Groups a/					Total
	34	35	36	37	38	
1. Use of capital	3.33	3.48	1.96	1.70	2.79	2.72
2. Labour	16.80	21.70	23.70	28.20	26.90	21.10
3. Raw materials	45.10	35.70	24.40	28.00	39.50	37.50
4. Energy, fuels and lubricants	7.04	3.41	3.29	2.40	2.19	4.62
5. Taxes	8.83	5.41	6.04	3.87	5.93	6.93
6. Interest	1.61	2.36	2.28	2.66	3.01	2.09
7. Other expenses	4.11	14.97	3.25	4.04	7.37	6.91
8. Not calculated b/	13.18	13.97	35.08	29.13	12.31	18.13
Total	100.00	100.00	100.00	100.00	100.00	100.00

a/ According to the United Nations, International Standard Industrial Classification of all Economic Activities. b/ Includes profits.

/G. THE

G. THE ELECTRONICS INDUSTRY

The Government has resolved to promote this sector - one of the newer fields of industry - through CORFO.

Up till now it has been developed entirely by private capital, with practically no government intervention or support, and has consisted only of the assembly of electronic apparatus for domestic use (radios, gramophones, television sets, etc.), carried out on a commercial rather than industrial basis.

The government programme will be aimed at the domestic manufacture of electronic components of general or specific uses and of certain products basic to any development plan for the industry and the manufacture or assembly of products of greater technological value, engineering products, electronic equipment for industrial use, etc.

The production lines envisaged are roughly as follows:

(a) Assembly of television sets

Production of about 80,000 sets a year, with a domestic component of at least 85 to 90 per cent of their value, is envisaged for the end of the decade, to be achieved by a horizontal integration process.

Specific manufacturing projects have already been approved and programmes for a progressive increase in the domestic component established. These will not only economize on foreign exchange but raise the technological levels of domestic industry.

(b) Other manufactures and assembling of electronic apparatus for domestic use

An increase in the quantity and the domestic component of present production of radios, radiograms and gramophones is envisaged. These manufactures would be essentially for domestic consumption, except that of gramophones, which might be exported to LAFTA countries.

There are also plans to begin the assembly of tape-recorders, again with a progressive increase in the domestic component.

/(c) Electronic

(c) Electronic parts, for radios and television sets in particular

Domestic production of the following parts is envisaged: cathode ray tubes, deflection yokes, synchronizers and fly-backs for television sets, for export to LAFTA countries as well as local consumption; speakers, coils, transformers, potentiometers, condensers, keyboards, etc. for various electronic apparatus. The condensers, keyboards and potentiometers would be consumed locally and the speakers, transformers and coils consumed locally and exported.

The possibility of manufacturing specialized parts for export to extraregional markets (e.g. the United States), by making well-calculated use of the country's natural and human resources and surplus capacity, has not been ruled out.

The initial studies for the production of radio and television parts are nearly finished and several projects for their manufacture submitted by domestic industrialists have been approved.

(d) Manufactures basic to the industry's development

The domestic production of articles basic to any programme for developing the manufacture of electronic final products or components is envisaged, in quantities and with qualities and prices in line with the needs of the domestic and LAFTA markets. These would include enamelled wire, ferrites, special magnetic materials, copper-clad, etc.

(e) Manufacture of professional electronic equipment

This would include radio and television transmission equipment, which could suitably be manufactured domestically once the national telecommunications network is completed and these media are extended throughout the country.

The possibility of stepping up the manufacture of VHF radiocommunications equipment, carrier system equipment, etc. is also being considered with special reference to transmissions to rural areas.

/(f) Manufacture

(f) Manufacture of automatic control, telemetric and telecommand equipment

This would comprise a broad range of productions, which might be undertaken basically with a view to external markets and with the idea of concentrating technical and economic resources in lines chosen in accordance with the characteristics of the particular market aimed at.

It is also intended that the manufactures mentioned in (e) and (f) should be carried out with a view to LAFTA trade and complementarity programmes, which might cover equipment ready for use or the parts needed for such equipment.

Finally, the Government has resolved to take advantage of the interest shown by the private sector in the manufacture of television sets and their parts in order to promote the development of manufactures of other electronic products of domestic use for home consumption and export. With this end in view, it is prepared to finance through CORFO projects for the manufacture of electronic parts for export under LAFTA industrial complementarity agreements or even to third countries.

Chapter V

POLICY MEASURES FOR INDUSTRIAL DEVELOPMENT

1. Government industrial promotion activities

The general governmental policy for industrial promotion is oriented toward the following objectives:

(i) To take fullest advantage, in an orderly fashion, of the country's natural resources which lend themselves to industrialization;

(ii) To direct the internal structure of the industrial sector, in such a way that the fullest possible complementarity may be reached through large-scale operations which fully utilize such resources;

(iii) To increase productivity in existing enterprises, by renewals, supply priorities, etc.;

(iv) To influence industrial production cost structure in order to put it on a sound basis for international competition.

Government promotion in Chile is almost entirely directed by its agency, CORFO. This promotion is accomplished in various ways: in some cases on the basis of technical and economic studies determining activities which ought to be developed; in others through incentives to and contact with the private sector; in other through the setting up of state or mixed enterprises.

CORFO provides financial help to the country's general industrial development through domestic or foreign currency loans and guarantees, for financing part of the acquisition of the fixed assets needed for new industrial projects or growth of existing industries.

CORFO in addition finances directly those industrial projects which have not interested the private investor but which are necessary to the country, helpful to its economy or basic to future development in a given industrial sector.

Direct government investment may be directed toward gaining wider markets or discovering new resources suitable for industrialization.

/Government financial

Government financial promotion is accomplished under sectoral programmes, several of which have been analyzed in chapter IV.

In addition to this direct financial aid to industrial projects in the private sector, CORFO makes recommendations concerning private banking credit operations, thus maintaining a consistent policy for most of the financial sources used by industry.

In addition, to encourage certain new and important industrial groups, to promote investment by foreign capital, and to stimulate certain areas of the country, tax and customs exemptions have been legally established.

Finally, institutes have been set up to assist productivity in various industrial sectors. Usually international organizations collaborate with the Chilean government in the establishment and financing of these institutes in order better to channel the foreign technical assistance necessary for Chile's development. Currently in operation are the Fisheries Development Institute, Forestry Institute, Technical Assistance Service, etc.

2. Customs protection

According to the Chilean laws concerning foreign trade, anyone may import any quantity of a particular article, provided that it is listed as a permissible import and complies with whatever regulations are pertinent. Thus, Chile grants freedom to import, subject to regulations for directing and controlling the flow of imports.

At first, the most important control was the tarriff. However, its out-dated regulations and the difficulties in legally modifying them led to the creation of other means which gave the authorities sufficient leeway to regulate the entry of foreign goods in accordance with the country's needs and economic fluctuations.

The new instruments, created for these purposes, were the list of permitted imports, prior deposits on imports, additional duties, refusal of import licenses and the list of prohibited imports.

These are used for two specific purposes: protection of production activity and maintenance of the balance of payments.

/Protection of

Protection of domestic production activity has usually been accomplished by heavy duties on the import of highly processed products which are being manufactured domestically, and by lessening the duties on imported goods of lesser value destined for use by domestic industry as parts of a finished product or as raw materials.

In order to maintain the balance of payments, the policy has been to prohibit or tax heavily the import of luxuries and of goods whose domestic production satisfies Chilean consumption and production needs.

(a) Means of regulation

(i) Customs tariff

The present Customs tariff was put into effect through Law N° 4321 of February 27, 1928. It consists of 1,944 items and sub-items decreed by this law or the General Customs Board. These items and sub-items fall into three chapters, according to the nature of the product, each of which is divided into sections: Section A, products of extractive industries; Section B, products of manufacturing industry, and Section C, money and precious metals. The tariff includes interpretative regulations and explanatory notes which assist customs administration in such aspects as evaluation; wording of regulations; specifications of chemical products and machinery; and special rulings.

The tariff establishes two types of duty; specific, and ad valorem.

The products mentioned in the tariff are subject to a levy or tax in six penny gold pesos on a taxable unit which may be in terms of weight, size, or number. This duty was used to protect domestic industry, and until 1936 was the only import regulator. Its importance has lessened with the imposition of subsequent duties.

Ad valorem duties were created by Law N° 5786 of January 2, 1936 and revised later by Financial Decree N° 772 of August 18, 1943. The Law established a duty based on the value c.i.f. of the merchandise plus interment charges. The levels for this type of charges are 3 per cent for commodities of prime necessity and certain raw materials; 30 per cent for current consumption goods, raw materials, and capital goods; and from 50 to 62 per cent for goods considered sumptuary. This duty at present is the chief source of revenue from foreign trade, as it brought in 50 per cent of the customs total for 1964 and in the first six months of 1965 58 per cent.

Changes in the tariff, whether in its structure of items or duty levels, must be accomplished through legislation. However, the President of the Republic is empowered to suspend or lower duties affecting goods of prime necessity and those indispensable for public health, and can also raise duties by up to 50 per cent on goods similar to those produced in sufficient quantity by Chile.

The General Customs Board is empowered to regulate imports of goods not specifically mentioned in the tariff, by including them in existing classifications or by creating new sub-items.

Thus the tariff can be used to assist the development of domestic production, through its ad valorem duties, which facilitate the importation of raw materials and capital goods, and the President's power to raise tariffs on goods already produced in sufficient quantity by domestic industry.

However, it must be recognized that the tariff no longer plays an important role in the country's industrial development policies. It has been replaced during the last 10 years by the means about to be discussed.

(ii) List of Permitted Imports

Apart from the products which appear in the tariff, the government decides on goods that can be imported, and may include them in the list of permitted imports. It is easy to include or exclude such products, as well as to create new sub-items within those existing, requiring only a Supreme Decree by the Ministry of Economy, Development and Reconstruction. Thus the list of permitted imports may be adapted quickly to the needs of the country's economic development. This ease of operation has made it a most efficient means of orienting imports, and its changes are in accord with regular studies of the needs of Chilean economy made by the various organizations concerned.

(iii) Prior deposits on imports

At the time of registering imports with the Central Bank, a deposit in normal currency must be made, which is to be held not less than 90 days from the date of import authorisation.

/The deposit

The deposit percentage varies according to the nature of the merchandise and is based on the c.i.f. value of the import. The deposit is returned only at the end of the allotted time, upon presentation of the interrment vouchers, which must equal the total of the merchandise.

This procedure is of great efficiency in regulating the system, as an agreement of the executive committee of the Central Bank is all that is needed to change the amount of deposit required. Even if the prior deposit was created as a means of regulating the balance of payments, in practice it continues to play an important part in guiding industrial development. The amounts of the deposits, and the ease in varying them have made this possible. The rates have reached as much as 10,000 per cent of the c.i.f. value of the product, and the means of determining them answer the needs of protection and stimulus of the country's production.

(iv) Additional duties

Additional duties are based on the c.i.f. value of the merchandise to be imported. The percentage can be as high as 400 per cent of this value.

These duties are set by the President of the Republic by Decree of the Ministry of Finance, and can be eliminated, suspended or modified by him when the country's needs make it advisable. For these reasons, and because of the manner in which it has been used, the additional duty is in practice the principal means for effectively controlling permitted imports.

(v) List of Prohibited Imports

As with the List of Permitted Imports, the authorities use this list as a control over imports, and have included those goods considered undesirable, particularly in their effect upon the balance of payments. And in both lists, products may be included or excluded according to a Supreme Decree of the Ministry of Economy, Development and Reconstruction, thus achieving the flexibility needed in today's direction and control of foreign trade.

(vi) Refusal of Import Licenses

In order to maintain the foreign balance of payments, the Central Bank, (empowered by Law N° 16101 of January 15, 1965) may refuse all import licenses in one or more classifications of permitted imports, when the sum total of licenses granted in a fixed calendar months exceeds by more than 5 per cent the monthly average of those expedited during the previous 12 months. This power of refusal may affect licenses of one or more classifications, regardless of whether or not they are responsible for the excess in question.

(vii) Exceptions to the Import Régime

Current legislation includes several procedures for making exceptions in order to favour certain importations because of their type, the activity for which they are intended, the person or organization importing them, or the region of the country where the transaction takes place.

(b) General Conditions governing the imports of various industries

From the brief description of the chief instruments of the Chilean Import Régime, it will be seen that these have gradually increased through the years in order to answer the needs of the country's economic development.

The characteristics of these regulatory mechanisms have relegated the tariff to a secondary role as a means of protecting and encouraging the industrial development of the country. This most important role is now filled chiefly by additional duties and prior deposits, within the framework of the lists of permitted and prohibited imports.

A quick examination of the situation of different industries in the present structure of imports permits certain conclusions regarding the manner in which this structure protects and stimulates certain activities.

(i) List of Permitted Imports

An examination of the goods entered in the List of Permitted Imports makes clear, through the amount of prior deposits and additional duties, that certain industrial sectors are thoroughly protected from foreign competition regarding the finished product. They enjoy facilities for importation of the inputs necessary for their manufacture. Among the principal sectors in this group are: tanneries and finishing workshops; the manufacture of paints, varnishes and lacquers; the manufacture of pharmaceutical products (drugs); and milling products.

A second grouping is that of industrial sectors enjoying easy importation of raw materials. Among these are: rubber manufacturing, tobacco, textiles, chemicals in general, pharmaceutical products in general, metallurgic products in general, and electric products.

In addition, exemptions are granted to industry for the importation of machinery and equipment. Deposits and taxes for these capital goods are very low, except for those considered in adequate production by Chilean industry. The favoured treatment of capital goods extends to all industry, in general. However, there are certain sectors in need of special stimulation.

(ii) List of Prohibited Imports

This list completely protects the following industries: mining of metal ores, lumbering, food, canning, sugar refining, liquor, wine and beer, tobacco, spinning and clothing, explosives, steel, copper manufacturing, ceramics and glass, footwear and other leather articles, pulp and paper, electronics (tubes), bicycles, household articles, and furniture and fixtures.

Certain chemical and pharmaceutical industries as well as producers of machinery, and tools are protected by the list. But this is not as overall a coverage as might appear, as it applies only to certain sectors. A great number of finished products of these industries appear in the list of permitted imports.

Among chemicals and pharmaceutical products, the following are protected: toiletries, prepared and synthetic fertilizers, anilines, soaps and detergents. The steel industry is protected in its pipes and fittings, mining and agricultural machinery, hand tools manufactured in Chile, pumps, boilers, electric motors, transformers, freight cars, and railway parts.

(iii) Special Import Regulations

There are various special import regulations. Large-scale copper mining is not subject to current import regulations, therefore it does not operate through the Central Bank but through the Department of Copper. The nitrate companies controlled by COVENSA are in a similar situation. The fishing industry imports a great part of its necessary material subject only in part to the current import regulations. Its imports must be registered with the Central Bank although no deposit is required, and they are not affected by the monthly revisions of categories.

Certain areas of foreign trade not subject to the same conditions as the rest of the country must be considered.

The principal total or partial exemptions are:

1. Nitrate industry. Law 12033/956 and Law 13305/959. Tax exemption on machinery and materials destined exclusively for the industry's development.
2. Copper mining. Law 11828/955 and modifications. Tax and duty exemption on import of machinery and materials designed for the exploitation and improvement of said mines.
3. Producers of pig iron or sheet steel. Laws 7743/943 and 7896/944. Exemption on machinery and materials designated for the operation of mines and plants.
4. Agricultural industry. Law 9839/50 and Decree 1272/61. Exemption on agricultural machinery according to Finance Decree 11206.
5. Fishing industry. Decree 1272/61 and DFL 266/60. Exemption on fishing material and machinery for the industry.
6. Fertilizers. Law 10323/952. Exemption on phosphoric anhydrides and minerals for prepared fertilizers.
7. Machinery for export industry. DFL 257/960. Exemption on machinery and equipment designated for enterprises which produce exclusively for export.
8. New industries. Decree 1272/961. Exemption on machinery for industries which do not already exist in Chile and 80 per cent of whose raw material is Chilean in origin.
9. Inflows of foreign capital. DFL 258/960. Exemption on plants and machinery imported as capital which comply with this decree.
10. National defense. Law 7144/942. Exemption on military supplies and material for national defense.
11. Journalistic enterprises. Law 9311/949; 9866/951 and 10521/952. Exemption on *ad-valorem* duties and turnover tax. Only on paper and materials exclusively for newspapers, magazines and books.
12. State and recognized private universities. Laws 13633/959; 11519/954; 15172/963 and 13713/959. Exemption on duties on machinery and material exclusively for use in teaching activities and scientific investigation.
13. Exempted areas. Exemptions and special provisions for the following areas:

A. Arica. Laws 13039/58; 14555/61; 14824 and 15077/962 and 13305/959.

B. Pisagua, Iquique, Taltal and Chañaral. Laws 12937 and 13305/959.

C. Provinces of Tarapacá and Antofagasta and Department of Chañaral. Laws 12858/958 and 13305/959.

D. Chiloé, Aysén and Magallanes. Laws 12008/956; 12084/956; 13305/959; 14555/961; 14824 and 15077/962.

/Table 60

Table 60

CHILE: IMPORT DUTIES ON CERTAIN INDUSTRIAL PRODUCTS

Tariff item	Product	1963 importation (in thousands of dollars)	Tax Burden a/
57	Crude rubber	2 282	40.68
52	Cork in slabs	498	44.51
1112	Titanium dioxide	915	76.06
1102	Anilines	2 682	75.20
1715	Paper for periodicals	845	140.30
1562	Fire-brick	4 922	39.79
1255-001	Soft iron	2 756	84.39
4	Aluminum ingots	1 336	41.54
1358	Machine tools	G 30 503	124.76
1361	Machine replacement parts	G 19 112	40.98
1358	Construction machinery	G 30 503	124.76
1358-062	Printing machinery	812	123.59
1358	Automatic looms	128	124.81
1290	Ball-bearings	2 953	39.45
1401	Audion tubes and other radio tubes	1 016	164.93
1430	Steam locomotives	116	37.72
1439	Locomotive replacement parts	730	39.48
1492	Automobile replacement parts	5 087	43.38
1791	Watches	331	166.35
1194	Sheet iron	80	63.11
1087	Synthetic resins	8 042	62.62
1095	Kerosene in tanks	1 473	3.30
43 J	Diesel oil	4 452	45.10
443 J	Fuel oil	245	45.12

Source: Executive Secretariat for Latin American Free Trade Association Affairs.

a/ Percentage of the c.i.f. value in October 1965, excluding prior deposits.

/3. Industrial

3. Industrial credit policy

(a) Analysis of Chilean industrial financing

A report was prepared by INSORA (Instituto de Organización y Administración) concerning a sampling of industrial enterprises in the province of Santiago, and will serve as a basis for the following analysis. The financial resources available to Chilean industry were considered to be the following:

(i) Increase of current liabilities;
(ii) Increase of deferred liabilities;
(iii) Decrease of assets.

The following were considered as uses of funds:

(i) Increase of assets;
(ii) Decreases in current liabilities;
(iii) Decreases in deferred liabilities.

In addition, the INSORA study presented comparative figures for Chile, the United States, France and India. Among those countries there are differences in accounting procedures and tax systems and terminology. Although the analysis is far from precise, certain general conclusions may be reached.

It will be noted immediately that Chile's internal resources are almost entirely divided between working capital and fixed capital. In the other countries, there is a great similarity between the total internal resources and the amount used for increasing fixed capital. This obviously leads to a higher development rate and represents a sounder financial policy.

The internal resources in Chile are 80 per cent undistributed profits and 20 per cent depreciations. In the United States and India, the funds created by depreciations are higher than those of undistributed profits.

In the authors' opinion, an estimate must be made of the unreal nature of profit figures given by industrial enterprises, as they do not list depreciations covering the cost of replacements, and are exaggerated, due to inflation.

/Table 61

Table 61

VARIOUS COUNTRIES: SOURCES AND USES OF FUNDS IN INDUSTRY

(Percentages)

Source	France 1955	India 1951-53	United States 1946-56	Chile 1949-60
Internal	63.3	63.3	58.3	52.3
Undistributed profits	-	27.8	28.1	42.3
Depreciations	-	35.5	30.2	10.0
Short-term external	15.3	22.0	19.8	41.3
Debts	14.7	7.4	13.3	21.3
Reserves	0.6	14.6	6.5	20.0
Long-term external	21.4	14.7	21.9	6.4
Stock issues	11.1	8.9	18.1	4.5
Debts	10.3	5.8	3.8	1.9
Total funds	100.0	100.0	100.0	100.0
Uses				
Fixed capital	65.0	62.0	64.0	24.2
Working capital	32.0	32.0	36.0	72.9
Other assets	3.0	6.0	-	2.9
Total uses	100.0	100.0	100.0	100.0

/If the

If the foregoing is valid, it seems logical to suppose that an extraordinarily high percentage of real profits is being distributed as dividends, with a consequent limiting of expansion possibilities and a pressure upon the banking system to furnish working capital.

The chief difference between the financing systems of the countries mentioned is the percentage of short-term debts, which is considerably higher in Chile.

The fundamental influencing factor is the low real cost of this type of financing, due to inflation which causes the real interest rates to be usually negative.

Long-term financing by external sources is extraordinarily low (6.4 per cent of the total), in relation to the United States (21.9 per cent) and India (14.7 per cent). It is worth emphasizing that India's long-term financing is more than twice that of Chile.

A most important factor in this situation is the very small interest in developing the Chilean capital market which certain groups have shown, as an increase of shareholders might endanger their control and, on the other hand, there is a corresponding lack of confidence on the part of small investors in the management of Chilean stock companies. It seems evident that a feeling of confidence must be created swiftly among the public in order that business may use the potentially large domestic savings.

Another important reason for the low percentage of long-term external financing is the almost total absence of medium-term and long-term loans, chiefly due to the inflation which the country has experienced and which has led the financial institutions allowed to grant this type of loan to suspend or reduce them.

Development banks, with a system of readjustable loans, will be able to satisfy this vital need of the country's industry.

In the three countries used for comparison, the principle use for available funds is that of increasing fixed capital, with much less used for working capital and other assets. In Chile, the exact opposite is true.

(b) Bank loans to industry

The growth rate of the gross domestic industrial product during 1960-64 was 20 per cent, while bank credit to the industrial sector grew at least 40 per cent in real terms. By comparing these figures, it will

/be seen

be seen that, during this period, the industrial sector could count on sufficient credit for its short-term needs, even though there was a strong demand for credit on the part of its customers.

The total banking system lessened its percentage of industrial credit from 22.54 to 21.72 of total credit supplied, while the Banco del Estado grants increased from 27.24 to 32.15 per cent.

According to a survey of the use of bank loans, 72.6 per cent of the various enterprises have been users of this credit. 38 per cent of small enterprises (fewer than 50 workers) do not use credit, as contrasted with 18 per cent of large enterprises (more than 200 workers). 75 per cent of these non-users simply did not apply for it.

These figures indicate a concentration of credit in large industry.

In addition, it is interesting to note that between 75 and 80 per cent of enterprises requesting credit consider that their needs were met with an adequate sum. 75 per cent of firms whose requests were not fully met considered that the lesser sum was not harmful to their normal operation.

This confirms the previous assertion that normal needs for industrial working capital have been met.

(c) New types of credit

The two principal credit problems of industrial enterprises are: (i) medium or long-term loans for financing enlargement or improvement of production capacity are not available; and (ii) short-term credit is unstable, difficult to effect quickly, and does not take into consideration the total operation of the enterprise.

Recently two most important means for lessening these deficiencies have been promoted.

Development Bank. Once in operation, this bank would choose or give priority to industrial projects according to the following standards:

(i) Projects which would tend to improve Chile's balance of payments through:

- Development of export industries presenting comparative advantages, especially to LAFTA countries.
- Development of industries for import substitution, providing these could finally produce at a reasonable cost, in international terms.

(ii) Projects which would mean lower costs in existing industries, with correspondingly lower prices to the consumer.

(iii) Projects which would mean production increases in articles of obvious priority in the National Development Plan.

(iv) High-priority regional development projects. It is of basic importance that studies be made of the investment alternatives considered by industrial enterprises seeking credit for new intallations. Their decision would affect the enterprise's profit, and consequently, the country's welfare.

Budgeted credit lines. As has been stated, the present credit system keeps business executives in such uncertainty, that a disproportionate amount of time must be spent in "banking gymnastics". This leads to a neglect of such important factors as planning, and control of production, sales, payments, etc. However, a financial analysis of industrial enterprises shows that bank indebtedness remains relatively constant. Credit budgeting answers the need for maintaining order and stability.

The enterprises must present a complete picture of their financial needs for a given time. Knowing the sequence of these needs, the banks can programme the use of there resources more efficiently.

The resolution of the Central Bank and the statute of the Superintendencia de Bancos concerning these credit means, stipulate the conditions and the reports to be presented, as well as the obligations of the contracting parties.

Enterprises must agree to these principal situations:

(i) All payments must be made in cash;

(ii) The bank or banks involved are to be given all the firm's income, proportional to the financing provided;

(iii) The bank or banks require that the enterprises periodically give proof, with necessary documentation, of their fulfilment of the contractual obligations. Basically these reports are:
- Annual financial budget, divided into quarters;
- Later report on the functioning of the budget;
- Balance Sheet and Profit and Loss Statement;
- Statement of sources and uses of funds.

/(iv) The

(iv) The enterprise pledges itself not to solicit other short-term bank credit.

In addition, the bank or banks are obliged to provide the enterprise with maximum resources, according to a time schedule fixed according to the budget.

The banking enterprises are to receive interest equal to that of transactions not involving lines of credit.

(d) Government financial help to industrial development

The government's financial support of industrial sector investment is mainly centered in CORFO, whose credit activity is based on the needs specific development plans, using available means.

CORFO's assistance to the private sector is effected through loans in domestic or foreign currency and guarantees which permit the acquisition of fixed assets needed by new industrial projects or the growth of already established industries, which are in the country's interest. These industrial loans are given in order to consolidate projects which usually originate in the private sector.

At the same time, loans are granted for pre-investment studies made to prove the economic and technical feasibility of specific industrial projects.

The procedures normally used in granting these loans are sufficiently flexible to accomodate the needs of a specific industrial project and are arranged so as to permit the enterprise's normal operation.

As far as length of time is concerned, these loans have run between 3 and 10 years, with initial grade periods of 1/2 to 3 years: the interest rate is 6 per cent annually for those given in foreign currency, and 6 to 12 per cent for those in domestic currency; the amount is determined according to the worth of the industrial project and its importance to Chile, and is usually about 50 per cent of the necessary fixed investment. In most of the loans in domestic currency the sum is readjusted according to the annual variation in the index of wholesale prices of domestic industrial products, calculated by the Bureau of Statistics and Census.

/Thus, in

Thus, in the last three years, 1963, 1964, and 1965, loans totalling 42 million dollars (in escudos and dollars) have been given. In addition private Chilean industrialists have received 15 million dollars worth of loans from foreign sources.

Table 62 shows the loans granted by CORFO to the private industrial sector in the three years mentioned.

Table 62

CHILE: LOANS BY CORFO TO PRIVATE INDUSTRY

(In thousands of dollars)

Year	Loans		Guarantees or Collateral
	Domestic currency	Dollars	
1963	7 390	6 006	7 459
1964	4 426	5 454	4 845
1965	7 651	11 140	3 037

It must be pointed out that certain important types of credit operations do not appear in the foregoing table, as they relate to government or mixed enterprises. Only CORFO loans and guarantees to the private sector are included.

The loans and guarantees just listed were granted principally to the following headings: fishing, lumber and forestry, metallurgy, chemicals, construction materials and food.

CORFO obtains the necessary financing for these programmes from foreign sources (IDB, AID, direct loans), government contributions and its own earnings.

/4. Taxation

4. Taxation policy as a means of industrial investment promotion and orientation

In general, industry is subject to the same taxation treatment as other economic activities, as there are no special taxes applicable.

(a) Taxation of profits

(i) Concerning income tax, industrial profits are taxed in the First Category which covers incomes from activities using capital, with a general rate of 20 per cent on taxable liquid income, collected or due, according to the income tax.

However, there are important exceptions to this rule:

- Stock companies are subject to a 30 per cent profits tax, with the proviso that shareholders are liable to a personal tax only if said profits are distributed to them. On the other hand, profit re-investment in the form of bonus stock or increase in share value does not impose taxation on the beneficiary.

Individuals or associations of persons liable to taxation under the First Category and the Second Category (at 3.5 per cent) may deduct a sum equal to one official annual living wage per person, with a maximum of four deductions for associations. An individual may deduct only one employer's salary from the group of enterprises in which he is owner, member or partner.

- Individuals who hold no paid-up capital or whose paid-up capital does not exceed six annual living wages, pay in the First Category at 3.5 per cent on taxable income which does not exceed three annual living wages and at 20 per cent on amounts in excess of that.

(ii) In addition, industrial enterprises may be subject to additional taxes or the capital gains tax, both included in the Income Tax Law.

Foreign non-resident individuals and corporations established abroad who have any kind of permanent establishment in Chile pay additional taxes of 30 per cent on the total income earned in Chile.

Profits on expropriation or indemnification of damages to capital assets, or expropriation of Right of Usufruct or industrial property, are liable to a 20 per cent tax. These profits are determined by comparing the expropriation value with its initial value, according to the Income Tax Law.

/(b) Taxation

(b) Taxation of property

(i) Fixed assets (whether by nature or by implantation) are subject to the land tax, whose rate is based on an appraisal by the Internal Revenue Service. This tax is at a rate of 20 per cent per thousand dollars annual income based on said appraisal.

The Land Tax Law excludes machinery used in industrial operations, even when it is stationary, and does not tax buildings which house this machinery. This is of benefit to industrial activity.

(ii) The tax on minimal presumptive income affects individuals according to their properties as of October 31, 1964. An owner, partner or joint holder of an industrial enterprise must reckon the percentage value of his capital, or holding, in the enterprise in his total property. The law defines capital, or holding, in an enterprise as the liquid property remaining in the enterprise after current liabilities have been deducted from assets, according to the enterprise's balance as of December 31, 1964 or immediately before.

The liquid property of the taxpayer, including the value of his holding in the enterprise, is presumed to give an annual income of 6 per cent. A progressive scale of rates is applied to this income to determine the tax due.

This tax is of a temporary nature, valid only for 1965, 1966 and 1967.

(c) Taxation of sales and services

(i) The Sales Tax Law (compraventa) taxes those operations designed to deliver moveable physical goods. The tax is determined by the price or value of the transaction. The Internal Revenue Service is empowered to adjust it should it be much lower than normal.

This tax is transferable as it is included in the price or value of the transaction, but the seller is legally responsible for its declaration and payment to the Treasury.

This tax is determined by the nature of the transaction, averaging 6 per cent.

(ii) The Business Turnover tax (Cifra de Negocios) affects individuals or corporations, who through dealings, services or loans of any sort, recieve interest, bonuses, commission, or other forms of payment. This tax is

/transferable, as

transferable, as is the sales tax, but must be entered on a separate form, as the recipient is legally responsible for declaration and payment to the Treasury. The general rate for this tax is 15 per cent.

(d) **Fiscal rulings concerning depreciation of assets, re-investment of profits, and revaluation of assets.**

Regulations for these matters are chiefly found in the Income Tax Law, where they help determine the amount of taxable liquid revenue.

These regulations generally apply to all the activities in the First Category, as there are no special rulings for this type of industry.

As there is such a scarcity of legal rulings concerning the above problems, the tax administration has found it necessary to establish the following procedures.

(i) Depreciation of assets: The Income Tax Law authorizes a deduction from the gross income as an expenditure of a sum acting as amortization for the using up, wear and destruction of goods used in businesses or enterprises including an appropriation for the residual value of the goods, when they must remain unused or be replaced.

It is the duty of the Income Tax Bureau to set up terms of payments and amortization percentages, based on the probable durability of the respective goods, considering their nature or characteristics and the conditions of work and wear to which they are subjected.

The law does not allow amortizations for the exhaustion of natural substances in mining property.

The President of the Republic was empowered to decree a ruling concerning accelerated amortization of machines and installations, which favours enterprises which develop certain beneficial production activities, granting them a higher amortization percentage than that generally fixed by the Internal Revenue Bureau.

? (ii) Re-investment of profits: The Income Tax Law does not contemplate exempting the amount of an enterprise's profits destined to be re-invested in the enterprise. On the contrary, the law states that distribution of profits or accumulated funds to stock-holders in the form of bonus stock or increase in stock values is not to be regarded as income, as it represents an equivalent capitalization.

/(iii) Revaluation

(iii) Revaluation of assets: The Income Tax Law obliges taxpayers in the First Category who declare cash incomes, to adjust their capital annually in current money, according to the difference between the consumer price index of the calendar months previous to the date of the balance sheet and that of the previous year. The consumer price index is set by the National Bureau of Statistics and Census. The taxpayer's capital is defined as the liquid property remaining in his favour after the demandable liabilities have been deducted from the assets in the balance sheet, without including the profits or losses of the financial year. The following must be deducted previously from the list of assets: intangible, nominal, temporary, and other types of securities specified by the Regional Tax Authority, which do not represent cash investments.

The personal securities of the individual entrepreneur which have been put into the business form part of this capital, according to the length of time they have been in use in it.

The higher valuation resulting from revaluation is not taxable and is legally considered as owned capital from the day following the balance sheet, both as regards the taxpayer and the stockholders and partners.

The revaluation is applied as follows: on fixed asset real property up to the sum resulting from its net value adjustment according to the consumer price index variation previously specified; on transferable securities, according to the latest market quotation. The balance of these revaluations is then credited or debited to the profits of the financial year. The addition or deduction must not exceed 20 per cent of the taxable liquid income for that year.

The law states that the total revaluation must be used only to increase the enterprise's working capital.

(e) Fiscal rulings affecting industrial development

There are numerous laws which provide exceptional tax rulings in order to develop industrial activity in certain sectors or regions.

(i) Exemptions for importations of new machinery. The importation of new machinery and further equipment for setting up new types of industries is exempt from the following duties: import, *ad valorem*, storage, statistical, customs, and consular providing that such industries use at least 80 per cent domestic raw materials.

/(ii) The

(ii) The President of the Republic can postpone the cash payment of certain import and other duties which affect the importation of new machinery when it is for the setting up or modernization of industries.

(iii) The new types of equipment and machinery not produced in Chile and imported for use by enterprises which produce exclusively for export are exempt from all customs duties and taxes.

(iv) The President of the Republic may exempt companies which complement each other industrially, or which share capital, patents or technical advisory services in order to improve production methods, from turnover and transfer taxes on the sales transactions made and services rendered between these companies.

(v) An abatement of the First Category tax is granted to those manufacturing industries functioning without interruption from 1955-60, which through new installations or modifications of existing ones, have increased their real production by more than 10 per cent. This abatement is proportional to the increase, with a maximum of 50 per cent of the tax.

As an incentive to the setting-up of industries in certain areas of the country, there is an abatement favourable to factory or manufacturing industries outside the province of Santiago. If the industry consumes only domestic raw material, the abatement is 50 per cent of the tax; if imported raw material forms less than 50 per cent of the total used, the abatement is 20 per cent of the tax; if the industry has hot previously existed in the country, the previously stated abatements are 60 per cent and 30 per cent, respectively.

In addition, Chilean legislation contains exemptions or special tax regulations which favour certain industrial sectors. There are special regulations for nitrates, copper, metallurgy and steel, and exemptions for fishing and construction, etc., which would be lengthy to detail.

Finally, it must be pointed out that legislation tends to encourage industrial development through tax exemptions rather than direct subsidies. However, the government, through CORFO, has co-operated in financing industrial installations or expansions, whether by loans or mixed capital partnerships.

/5. Legal

5. Legal régime for foreign capital and enterprises

(a) General orientation of policy concerning foreign capital

The Chilean policy toward foreign capital may be considered highly favourable and without important limitations, except for those about to be discussed. These are justified, in most cases, by reasons of strategy and economic policy.

The treatment of foreign capital is determined by legal and constitutional rulings, currently in force, which protect investment and domestic capital from unfavourable discrimination.

The Constitution assures equality before the law, with accompanying guarantees, to all inhabitants of the Republic, citizens and aliens alike.

Certain laws have been laid down with a view to attracting foreign capital to Chile, others only to regulate its entrance.

The following is a comprehensive picture of the regulations affecting foreign investment.

(b) General régime

(i) Customary régime without formalities

Subject to the ordinary regulations for exportation and international exchange (Decree N° 1272 of 1961 of the Ministry of Economy, Development and Reconstruction) anyone may bring capital into Chile, provided that it is only in foreign currency. He may liquidate it in the market of his choice, be it the Central Bank or a commercial bank, without special formalities.

This system does not provide for any later guarantee for the repatriation of the capital and its profits, and may present difficulties in establishing its origin when tax problems arise.

(ii) Certificates of registration with the Central Bank of Chile

This system is established by Article 14 of the Decree N° 1272 mentioned above.

This states that individuals or corporations, domestic or foreign, may transfer capital in foreign exchange and liquidate it freely in the stock exchange provided that it is registered with the Central Bank. This organisation provides a registered, non-transferable certificate, which may be used later to return the capital and its profits in order to obtain foreign currency in the stock exchange.

(iii) Contract with the Central Bank of Chile

Article 16 of Decree 1272 enables the Executive Committee of the Central Bank to arrange contracts with investors, in which the applicable system of exchange is decided upon. The investor and the bank jointly decide in which foreign exchange market the investment will be liquidated and later returned, with its profits, for its repatriation.

As in the foregoing cases, this investment channel is used only for inflows in foreign currency.

The Central Bank has usually applied this system to inflows earmarked for production and commercial activities, and has stipulated that the capital brought in must remain in Chile for a minimum of three years, that the liquidation of foreign currency be effected through the bank itself, and that interest rates on loans be those normally in effect in the country of origin.

(iv) Immigrant property

Decree Law 69 of 1953 establishes the Immigrant Statute and is concerned with facilitating the entrance of immigrant's real property, exempting it in certain cases from taxes and customs duties.

(v) Investor's Statute

Decree Law 258 of 1960 is the principal legal instrument affecting foreign capital invested in Chile. It includes rules for the entrance, stay and repatriation of the said capital.

It provides that capital may enter as currency or equipment, and may originate as a loan.

The Statute decrees that capital may be used to begin, amplify, encourage, improve or renovate production, agricultural, mining, fishing, industrial, and other activities which are designated as beneficial by the President of the Republic.

The Statute provides for the following privileges:

- For capital inflow in general: Repatriation of capital in annual quotas, usually 10 per cent; repayment of profits or interest, without restriction; revaluation of the assets corresponding to the contributed capital, according to variations in the rate of exchange; amortization; guarantee of free access to the foreign-exchange market, in order to liquidate the investment and arrange for the repatriation of capital and profits or interest; the right to use foreign currencies arising from export in order to repatriate capital, profits, or interest. Reinvestment of profits or interest enjoys the same privileges as the original capital.

- Other privileges for special cases: For basic industries not as yet in Chile: complete exemption from custom duties (provided the machinery is new and the industry uses at least 80 per cent Chilean raw material). For industries established abroad which move to Chile, used machinery may be brought in. There are guarantees that evaluations under the First Category of the Income Tax Law will not be raised; that new special standards will not be used for determining income: and that new exclusive taxes will not be applied.

The President of the Republic decides whether inflows of capital are to be accepted or refused and whether one or more exemptions is to be granted upon recommendation by the Committee of Foreign Investment, a body including the Ministers of State and representatives of CORFO, the Banco del Estado and the Central Bank of Chile. Other members are two representatives from the Confederación de Producción y Comercio, a private sector organization.

If an offer of capital is accepted, the President of the Republic issues a Supreme Decree which authorizes the importation of capital and which states the pertinent exemptions. In addition to being published in the Official Gazette (Diario Oficial), the Decree is abridged to "Escritura Pública", which, according to Article 25 of the Statute, is tantamount to a contract between the government and the investor. Consequently, its provisions may not be modified without previous agreement of the parties.

This guarantee, recognized as a contract-law, assures the investor of the continuity of the arrangement agreed-upon for a stipulated period.

(c) Special régime

Apart from the systems mentioned above, there are those covering special fields, such as copper, iron and nitrate mining enterprises, as well as public services such as the Telephone and Electric Companies.

/Finally it

Finally it must be added that, wihtin Chile's policy for encouraging foreign investment, pacts have been made with the governments of the United States and the German Federal Republic which protect the investor from inconvertibility of funds, expropriation, war, revolution, etc.

Only one of these has become law through ratification by the Congress: the agreement with the United States concerning inconvertibility of funds.

(d) Treatment of foreign enterprises

It is necessary to re-emphasize that the Chilean Constitution guarantees non-discrimination to citizens, foreigners, individuals or corporations.

They may choose any type of organization recognized by Chilean civil or commercial legislation: partnerships, limited or unlimited; special partnerships; or corporations.

This does not mean that foreign enterprises may not operate as such in Chile, that is, through an agency or branch in another type of permanent establishment.

Individuals or corporations not domiciled or resident in the country, must pay, in place of the overall complementary tax affecting those domiciled or resident, an additional tax whose current rate is 37.5 per cent.

(e) Restrictions on foreign investment

The exceptions to the above rules are defined by certain laws which require a minimum percentage of domestic capital in the exploitation of certain activities. Law N° 7896, concerning exemptions for Chilean steel enterprises, requires corporations or partnerships to contain 60 per cent of Chilean capital; Law N° 12041, concerning exemptions for shipping, lighterege and wharfage, states that a ship belonging to a corporation is considered Chilean if 75 per cent of its capital belongs to Chileans; Law N° 10645 establishes similar standards for Chilean air lines, etc.

It must be pointed out that Law N° 9618 reserves petroleum exploitation and exploration, in any area where it is found, to the State, and prohibits the participation of private capital, domestic or foreign.

The above sums up the limitations indirectly affecting investment of foreign capital in Chile.

/(f) Fiscal

(f) Fiscal treatment accorded to foreign capital

Table 63 explains how the income tax affects an enterprise with foreign financing, excluding the varied range of indirect taxes which affect both citizens and foreigners.

Table 63

CHILE: COMPARATIVE PICTURE OF TAXES ON PROFITS DERIVED FROM COMMERCIAL, INDUSTRIAL, MINING AND FISHING ACTIVITIES

Taxable income	Stock companies		Limited or unlimited partnerships		Agency abroad	
	Per cent	100 escudos	Per cent	100 escudos	Per cent	100 escudos
Income tax						
First Category tax	30	30.00	20	20.00	20	20.00
Housing	5	5.00	5	5.00	5	5.00
Additional tax	-	-	30a/	30.00b/	30a/	30.00
Total income tax	35	35.00	55	55.00	55	55.00
Available for distribution		65.00		45.00		45.00
Additional tax on profit withdrawal a/	30a/	19.50	-	-	-	-
Available for net distribution	-	45.50	-	45.00	-	45.00
Actual rate of tax	54.50	54.50d/	55	55.00e/	55	55.00f/

Source: "Business in Chile", Section II, chapter 10; Price Waterhouse Peat & Co. 1965.

a/ With 25 per cent surtax on fiscal years 1965, 1966 and 1967, i.e. 37 per cent, since non-resident streckholders in stock companies pay an additional tax only on distributed profits, and in order to make the 7.5 per cent surtax applicable to non-resident stockholders under all circumstances, with or without a profit distribution, the law demands that this 7.5 per cent be paid in advance by these stockholders on their share of profits not distributed as dividends. Later, when a real dividend is declared, the amounts paid in advance by the non-resident stockholders toward the 7.5 per cent surtax will be credited to the 37.5 per cent tax then due.

b/ This tax is calculated on the non-resident partner's share of the company's taxable income.

c/ Reserved profits placed in legal reserve or working capital requirements will, in certain cases, alter the tax on profit distribution.

d/ Tax affecting non-resident stock-holders.

e/ Tax affecting non-resident partner.

f/ Income tax.

/6. Regulations

6. Regulations affecting small-scale industry

(a) Definition

There is not, as yet, a legal definition of what constitutes a small-scale industrial enterprise. In the credit programme of CORFO and the Technical Assistance Service the following definitions are used, to limit the number of borrowers:

Small-scale industry

(i) Between 10 and 30 persons, approximately.

(ii) Between 10 and 50 official annual living wages as fixed investment in machinery, equipment and tools.*

(iii) Annual sales between 20 and 200 annual living wages.*

Artisan industry

(i) From 1 to 10 persons, approximately.

(ii) Up to 10 annual living wages as fixed investment in machinery, equipment and tools.*

As general ad hoc definitions the following may be used:

Small industrial enterprises are those which:

- On their own account, produce and/or transform, in an establishment or industrial plan, substances or forces in a natural or prepared state, with or without mechanical means, for profit, and/or provide manual or mechanical services, with the exclusion of transport; and
- Permanently employ up to 50 persons, including their owners, joint holders or partners and their families, employees, workers and apprentices, and
- Have a fixed investment in machinery, equipment and tools worth up to 50 annual living wages.

(b) Economic and social importance of artisan and small-scale industry in Chile

The importance of artisan and small-scale industry is much greater than might be supposed.

In the first place, the number of establishments is extraordinarily large. There are about 60,000 artisan units or workshops and more than 5,000 small-scale industries throughout Chile. Those two figures give an adequate idea of what both sectors signify.

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* Escala A of the Department of Santiago

Secondly, they employ a considerable part (about 60 per cent) of the population working in manufacturing industry, and 11 per cent of the total population, with a considerably larger percentage partially dependent on them.

Thus, more than 1.1 in 10 Chileans live through this sector, whether as owner, partner, skilled workman, clerk, worker, employee or relation of these.

According to CORFO estimates, about 41 per cent of the gross manufacturing value added is accounted for by artisan and small-scale industry.

(c) Present situation and problems of small-scale enterprises

Two studies made by the Technical Assistance Service on artisan and small-scale industry provide a complete picture of their situation and problems, which are briefly as follows:

(i) Each type of industry, and the enterprises themselves, classified according to size, type and location, present an individual case. Development policy, in consequence, must consider these differences, as sufficient resources and other means for helping all enterprises do not exist. Preference must be given to those in urgent need, and measures must be applied toward their fullest and speediest success.

(ii) The enterprises' technical and economic problems are similar to those of other countries.

(iii) There is an inefficient use of production, capital and manpower. There are difficulties in financing, production methods, raw materials supplies, product marketing and administration in general. The owners and their workmen need better training and professional guidance. Apprenticeship in the enterprises themselves must be developed.

(d) Programme carried out by the Technical Assistance Service (Servicio de Cooperación Técnica)

The Service concerns itself with the small entrepreneurs' most urgent problems, particularly administrative, technical, technological, financial and commercial ones. Defining the general situation of the sector and finding the most efficient means toward its development.

The Service advises the sector through its Small-Scale Industry and Artisan Department, created late in 1962, which works through four basic programmes: Technical and Technological Assistance; Financial Assistance; Studies and Projects; and Information and Co-operation.

(i) Technical and Technological Assistance

Under this programme small-scale industries are advised in technical administrative and technological matters, in order to increase their productivity by rationalizing their administration and processes.

Up to December 31, 1965, technical administrative assistance was given to 316 small-scale industries of various types located in the country's principal areas. The majority of these industries have now received reports containing pertinent recommendations chiefly concerning production planning and control, costs, control of materials, plant and equipment layout, methods, etc.

122 small-scale enterprises of various sorts received technological advice during the same period, from three specialist groups: the mechanical group, concerned with mechanical projects, product design, the correct use of cutting tools, matrix design, thermal treatments, etc.; the chemical group, concerned with the food industry, product finishes (paint, chrome and nickel) and chemical problems in general; and the metallurgic group, concerned with moulding processes, the correct use of foundry sand, smelting processes, design, construction estimates for furnaces and ovens used by ferrous and non-ferrous metallurgic industries, etc.

(ii) Financial assistance

The object of this programme is to promote, study and report on medium and long-term loans for purchasing equipment and/or raw material to artisan and small-scale industry, which are then granted by CORFO. Artisan loans have the following characteristics:

They are not re-adjustable. Their interest rates are based on percentages of the bank rate in effect during the previous six months: during the first and second years, 70 per cent; the third year, 80 per cent; the fourth year, 90 per cent; and the fifth year, 100 per cent. For fixed capital investments (installations, equipment, machinery or storage sheds) the maximum term is five years, and for working capital (raw materials only), two years.

The regulations for small-scale industry are substantially the same. Loans of up to five years, are not re-adjustable. Those for between five and eight years have a 6 per cent interest rate and are re-adjustable according to the index of wholesale domestic industrial products. The term for working capital loans is 12 months. In special cases, small-scale industry may import equipment directly, and payment of customs duties and the loan itself may be deferred.

In this credit assistance, CORFO supplies the funds, fixes the rates, approves, and carries out the banking procedures of drawing-up, paying-out and recovering each loan. The Service prepares the technical and economic report and lends technical assistance to the borrower and supervises him.

As resources are limited, principles of selectivity are used, based on such aspects of the country's economic development as: generation or saving of foreign currency; sub-contracting; and lending of specialized services.

A list of priorities has been set up, according to CORFO standards, which favours enterprises important to regional development and folk and artistic crafts.

The credit programme is in effect throughout the country, and is administered by personnel permanently stationed in the provinces.

The work accomplished in financial assistance may be appreciated when it is considered that in two years of effective operation, 807 artisans have been granted a total of 3,482,000 escudos, and in one year loans to small-scale industrialists totalled 1,700,000 escudos.

This does not show the total work of the Technical Assistance Service, as the requests made and the reports prepared were considerably more.

Part of the loans were for reconstruction in the area affected by the earthquake of March, 1965.

Loan supervision is directed toward evaluating the results of this assistance. It has shown that the workshops benefited increased sales by an average of 39 per cent, personnel by an average of 20 per cent, and productivity by an average of 16 per cent.

/More and

More and more interested parties, in Santiago and the provinces have been receiving information concerning the Credit Assistance Programme of CORFO and the Technical Assistance Service. With details on the programme's objectives, terms and advantages.

(iii) Studies and projects

The aim of this programme is to carry out studies of a general nature with the view of guiding the development of small-scale and artisan industry and encouraging specific projects for setting up new small-scale industries.

The studies completed include:

Marketing studies: Several studies of markets and marketing, according to sectors and products, have been made in order to clarify the prospects of small-scale industrial and artisan enterprises, and determine most efficient means of distribution for them.

Basic small-business law: A rough draft has been made of a basic law for small-scale industrial enterprises. It consists of two parts. The first gives provisions relative to definition, registration, statistics and institutional bases; the second present measures for promotion through a Development Fund for Small-Scale Enterprises, facilities and exemptions from importation and internal taxes (income tax; inheritance, appropriations and donations taxes; sales tax, etc.)

Integral development project for small and medium-scale industries in Chile: This project considers an expansion and intensification of promotion of small and medium-scale industries throughout the country, by means of studies and research, preparation and starting of new individual industries and complexes, advisory services and technical and technological assistance, credit assistance, professional training, information and guidance, and development of co-operation, marketing, design and quality.

The United Nations Special Fund has been approached for technical assistance by experts, equipment for technical assistance to enterprises, and grants for professional training of the Service's staff members.

Preliminary study for an industrial complex in Osorno: A preliminary study has been made of a small-scale industrial complex in the city of Osorno, envisioning the establishment of 15 small-scale industries with common industrial services and four common development services (office of technical advice and assistance, service workshop, laboratories for experiments and quality control, instruction rooms).

These last would serve not only the industries of the complex but would advise and assist other small-scale industries in southern Chile.

Project for increasing the credit line through foreign loans and the establishment of a Development Bank: This project plans to give broader scope to the current credit aid programme of CORFO and the Technical Assistance Service. It would enable a larger number of artisan workshops and small-scale industries to modernize and improve their operation.

Preliminary study for a Savings and Guarantee Co-operative: This preliminary study is under consideration. It would partially guarantee the loans made to small entrepreneurs, should they not have sufficient bank guarantees. It would be a self-help organization, with a membership of artisans and small-scale industrialists. The funds for this co-operative are lacking, as the members' contributions would be insufficient, at first. Government or international assistance is necessary.

Project for a supply distribution society for small-scale and artisan industry: This project would help these industries with problems of raw material purchasing and product sales, as follows:

- By supplying commercial aid in buying raw materials, intermediate products, capital goods, machines, tools, accesories and parts.
- By increasing the sale and export of their products, whether in goods or services.
- By supplying pertinent information and technical assistance.
- By encouraging participation in fairs and expositions.
- By assisting the formation of other co-operatives and societies for supply and distribution.

The co-operative would not buy or sell on its own account, but only as a commission merchant, agent or representative of the members in purchasing raw materials and selling the finished products.

Project for setting-up artisan workshops: An economic study was made concerning the setting-up of artisan workshops in the fields of plumbing, electrical apparatus, heating, refrigeration, and electronics in the cities of Santiago, Valparaíso and Concepción.

Brochures were prepared with instructions for setting-up this kind of workshop. These are being distributed and support is being sought from the Promoción Popular for development.

Help has been given by I.C.E.M. an organization interested in bringing in highly-qualified European artisans in these fields.

Specific feasability studies by the Technical Assistance Service: Their object is to determine the need for new industries or the feasability of new products, up to the level of projections or technical and economic feasability studies. They include studies concerning agricultural machinery repairs, agricultural machinery parts, automotive parts and roller bearings.

/Feasability studies

Feasability studies for third parties: These studies are commissioned by interested parties, and are carried out, if warranted. Among these studies are those concerning castor oil, pressed brick, activated clay, electrical hand drills, magnesium hydroxide, a wool washer in Coyhaique, tire valves.

Regional projects: A sectorial emphasis was given to Studies for Regional Projects in August, 1965, when, with the technical assistance of the Chile-California Programme, a regional development plan, designed to use fully the natural resources of each area was started. Accordingly, the Osorno-Llanquihue project was studied, as well as the economic development preliminary studies for the Comuna de Palena and for the Comuna de Navarino e Isla Grande de Tierra del Fuego.

Information and co-operation: This programme aims to increase the participation of small-scale businesses in the country's economy, by improving their resources for dealing with domestic or foreign factors.

The work accomplished since March, 1964, when the Office of Information and Co-operation was started, includes various activities.

Up to October 31, 1965, 2,200 consultations were held with small-scale industrialists and artisans in Santiago and 800 in the provinces, and 8,000 copies of publications were handed out (3,000 in Santiago and 5,000 in the provinces) which dealt with various matters relating to co-operatives, associations, budgets, sub-contracting, credit assistance, establishment of new businesses, taxation, etc.

40 courses, attended by 670 small-scale industrialists and artisans, were given in Santiago, Valparaíso, Talca, Concepción, Temuco, Valdivia, Osorno and Punta Arenas, on subjects especially linked with commerce and administration.

Advisory services to associations of small-scale industrialists, producing in various headings, continued in Santiago and other cities.

The promotion of co-operatives is being carried out through educational courses, socio-economic studies, and advisory services to existing co-operatives or those in formation.

Information and advisory services to associations and co-operatives, in matters of budgeting, sub-contracting and design, are being maintained.

Special emphasis has been given to sub-contracting activities since these and limited productions of high-quality goods which, from their nature, cannot be produced profitably by large-scale industries, offer the best economic prospects for small-scale industry in Chile.

By efficient sub-contracting, the verticalization of large-scale industry will be avoided. This now happens in many large enterprises which are obliged to manufacture innumerable components of their principal product.

/Furthermore, high-quality,

Furthermore, high-quality, high-style, limited production articles, which follow certain fluctuations due to fashion trends or specialization, give great scope for the development of small-scale industry. In many cases, large-scale industry benefits from the fact that its exports contain a high manpower component.

Another important objective of this programme is the organizing of a Design Centre for small-scale and artisan industry. In the first stages, modular and functional furniture has been designed for lower income housing. In addition, designs for furnishings to be used in government constructed buildings have been studied and developed, and have been presented to co-operatives of small-scale industrialists.

7. Manpower training programmes

(a) Development of professional industrial training

Professional industrial training is carried out through two basic programmes: regular industrial instruction and programmes of professional adult education.

(i) Regular instruction is through the national system of education in industrial schools,[33] with selected pupils, with a minimum of sixth year primary education and between 12 and 17 years old.

The studies continue from three to five years. The graduates of the three-year course, after a six-month professional training-period in industry, are given the title of Práctico in one of the following specialized fields:

- Lathe mechanic
- Milling machine mechanic
- Tuning mechanic
- Typewriter repairman
- Dental technician
- Body finisher
- Electrician
- Electrical coil winder
- Automobile electrician
- Lathe carpenter
- Welder
- Locksmith-tinker
- Upholsterer-varnisher
- Tinsmith-plumber
- Cooper
- Shoemaker
- Saddler-leather worker
- Typographer-linotypist
- Bookbinder
- Line engraver
- Press operator
- Lithographer
- Photo-engraver
- Weaver
- Spinner
- Siser-dyer
- Tailor's operative
- Watchmaker

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[33] As set forth in the General Law of Fiscal Scholastic Establishments, under the direction of the Department of Professional Education. The educational reform now under way will change these regulations considerably.

Agricultural machinery operator
Tractor driver
Fisherman
Cast-maker
Building carpenter
Coachmaker
Jeweller
Barman
Chef
Pastry-cook
Waiter

The graduates of the five-year course, after nine months professional experience in industry, receive the title of Subtécnico in one of the following specialized fields:

Industrial mechanic
Agricultural mechanic
Die-maker
Electrician
Shipwright
Sanitary installer
Pattern maker
Machine and automobile mechanic
Forester
Furniture maker
Founder
Textile operative
Processer of fish and shellfish
Fishing boat master

In addition, there are two specialized schools: the National School of Graphic Arts and the National School of Tailoring, which offer, the degrees of Industrial Technician in Graphic Arts, and Tailoring Cutter, after nine months professional practice in industry and a board examination.

The study plans for industrial professional education include 41 class hours weekly in two different areas: general education and specialized professional training, which is gradually being extended to the upper level courses.

The entire system of professional industrial education is currently under revision. The government's Decree N° 21628, of December 10, 1964, has set up a Permanent Commission to advise on the planning and co-ordination of the various aspects of technical professional education at the scholastic and adult levels.

(ii) The Technical Assistance Service directs a far-reaching programme of adult professional industrial education.

In the organization of all its programmes, the Service uses manpower studies made by a group of engineers and economists to determine the need for qualified personnel in various economic sectors of the country. Specialists in work analysis, prepare methodical work procedures and the International Labour Organisation provides advisors. The latter introduced in 1960 the intensive teaching methodology now in use.

The Service's professional training programmes are closely allied with industry. Agreements have been made for the purpose of developing basic and advanced manpower training with certain private industries and

/industrialists associations

industrialists associations such as the Association of Metallurgical Industrialists (ASIMET), the Chilean Chamber of Construction, the Industrialits' Association of Valparaíso and Aconcagua (ASIVA), the Chilean Small Industrialists' Association (AMPICH), the Chilean Electrical Company, the National Electricity Corporation, etc.

Three basic types of programmes are carried out in factories, several institutions with which the Service has special agreements (viz. the Ministry of Education and the Army), or in the training centres.

The latter give intensive professional training courses of three types:

- Basic Training (600-800 hours), for workers without previous training in the particular occupation, usually given during the day.
- Advanced Training (150-200 hours), given in the evening, for workers in a particular field who wish to increase their technical knowledge of all its aspects; and
- Specialization (50-100 hours), given in the evening, for those who wish to concentrate on a particular aspect of their field and increase their knowledge and skill in it.

The Service has three professional training centres, located and specializing as follows:

Location	Number	Specialization
Valparaíso	1	Electricity
Valparaíso	1	Mechanics
Santiago	1	Construction, electricity
Santiago	3	Mechanics
Santiago	1	Industrial sewing
Santiago	1	Electricity
Talca	1	Construction, electricity
Concepción	1	Construction, mechanics
Temuco	1	Construction
Valdivia	1	Construction, electricity and mechanics
Lota	1	Construction

Soon these centres will be diversified to meet the needs of the various economic sectors, and seven new centres will be added.

The Training Centre for Instructors and Supervisors (CENFIS) is of importance. Its functions are, among others, to train instructors and supervisors necessary for the operation of the Service's programmes, and those c other institutions and businesses in general, regardless of size; constantly to study teaching techniques and procedures, in order to obtain the best methodolo for adult professional training; to spread the best teaching methods, etc.

The Service has signed an agreement with the Ministry of Education, through which CENFIS participates in the training and accreditation of technical teachers in industrial schools.

(b) Financing of industrial education

Chilean industrial education is carried out by government and private schools. In both instances, the Ministry of Education supervises and dictates the various courses given in industrial training programmes.

Private schools which follow the Ministry's programmes can receive a partial subsidy from the government.

The promotion of new schools may be effected by both the Ministry or private initiative. However, the Ministry alone may formulate new teaching programmes.

The Ministry of Education's 1964 budget was 264 million escudos, or 18.9 per cent of Chile's total budget. 11.5 million were allocated to industrial education, out of the total of 27 million for professional instruction.

The financing of the Technical Assistance Service's adult training programme is provided by the government through CORFO. This organization has received full international collaboration in matters of equipment and experts. The Service's 1965 professional education budget was 10 million escudos. In the last two years international contributions of equipment worth 1,128,000 dollars have been received.

The country's two technical universities have branches offering professional instruction on an intermediate level. The State Technical University has six of these schools and the Federico Santa María Technical University has one.

(c) Need for skilled worker training during 1960-1970

Studies by the Technical Assistance Service on the need for skilled worker training during 1960-1970 present the following figures:

(i) Skilled industrial manpower 1960: 371,900 persons and 1970: 559,300.

(ii) Training needs during the ten-year period: expansion, 117,000 persons; retirement and replacement, 70,100; raising of skill standard, 117,700; totalling 304,800 persons.

(iii) Means to be used for training during the ten-year period: informal on-the-job training, 200,000 persons ; training in industrial schools, 15,000; and other systems (principally Formación Profesional Acelerada o de Adultos FPA) 89,800; totalling 304,800 persons.

/(d) Graduates

(d) Graduates of various institutions engaged in manpower training

(i) Regular schools of professional training [34]

From 1955-1961, industrial schools averaged 22.25 graduates per school. This average rose to 32.68 during the period of 1962-1964.

A total of 39 industrial schools produced 1,275 graduates in 1965 (an average of 32.68), which adding promotions from the fourth year of specialization, gives a total of nearly 1,350. This figure should reach 1,500 in 1966 and 1,600 in 1967, when recently created schools will add their graduates.

Government education is responsible for the above figures. To these must be added the contributions of other educational agencies: private schools affiliated with Federación de Escuelas Técnicas Particulares 340 graduates; other private industrial schools, 90 graduates; State Technical University [35] schools, 70; Federico Santa Maria Technical University [36] school, 30; totalling 530 graduates.

5 per cent of the government school graduates, and 2 per cent of private school graduates go on to university studies, rather than joining the working population.[37]

About 1,900 graduates are expected in 1966, and 2,000 in 1967.

(ii) Adult professional training centres.

The largest adult training centre programme is carried out by the Technical Assistance Service. At present, after five years of functioning, this institution has 13 professional training centres throughout Chile, for the purpose of adult (18 years or over) basic and advanced training for jobs in manufacturing, construction and mining.

In 1965 these centres and other Service programmes graduated 14,000 persons.

Table 64 presents the results achieved in basic and advanced manpower training.

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[34] Proyecto para una racionalización integral de la educación industrial. Permanent Advisory Commission of Industrial Education, December 1965.

[35] This figure is arrived at by substracting the number of graduates who continue their education on the technician level from the total who finish the five-year trade school course. The figure is slightly increased by adding the number of drop-outs from the first-year technical course.

[36] Estimated figure.

[37] May 31, 1964, statistics of D.I.O.P.E. (Departamento de Investigaciones y Orientación Profesional y Educacional)

/Table 64

Table 64

CHILE: RESUME OF WORK ACCOMPLISHED BY THE TECHNICAL ASSISTANCE SERVICE AS OF OCTOBER 31, 1965

	Graduates 1960-64	Graduates 1965	Total graduates	In training	Total
Centers					
1. CENFTS	232	553	785	190	975
2. Construction Santiago	1 276	460	1 736	34	1 770
3. Concepción	1 129	238	1 367	211	1 578
4. Valdivia	720	349	1 069	33	1 102
5. Talca	510	131	641	58	699
6. Metallurgic	1 118	645	1 763	208	1 971
7. Needle Trades	333	148	481	72	553
8. Franco-Chilean Santiago	1 031	725	1 756	168	1 924
9. Anglo-Chilean Valparaíso	27	69	96	116	212
10. Lota	-	83	83	46	129
11. Franco-Chilean Valparaíso	-	163	163	190	353
12. Temuco	-	134	134	57	191
13. Chilean-Danish	-	-	-	71	71
	6 376	3 698	10 074	1 454	11 528
Programmes					
1. Arica	-	214	214	152	366
2. Iquique	1 278	373	1 651	216	1 867
3. Antofagasta	175	171	346	137	483
4. Atacama	10	87	97	69	166
5. Industrial School	663	586	1 249	543	1 792
6. Army	953	339	1 292	1 041	2 333
7. Agricultural machinery	398	295	693	211	904
8. Businesses	6 759	2 036	9 065	425	9 490
	10 236	4 371	14 607	2 794	17 401
Special programmes					
1. Operation Techo	-	498	498	-	498
2. Franco-Chilean Instructional Santiago a/	715	719	1 434	-	1 434
3. Franco-Chilean Instructional Valparaíso a/	-	466	466	-	466
	715	1 683	2 398	-	2 398
	17 327	9 752	27 079	4 248	31 327

Total graduated in 1965	9 752
Total in training	4 248
Total	14 000

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a/ Basic Electricity

The following table shows the results produced by the Department of Professional Training during 1965, according to specialized activities, as of October 31.

Table 65

CHILE: INDUSTRIAL EDUCATION RESULTS BY SPECIALIZED ACTIVITIES

Activity	Basic courses	Advanced courses	Specialization courses	Total
Mechanics	1 036	2 232	325	3 593
Construction	1 706	861	103	2 670
Electricity	412	920	26	1 358
Needle Trades	191	62	-	253
Agriculture	168	439	-	607
Fishing	91	248	-	339
Mining	79	44	-	123
Shoemaking	23	-	-	23
Teacher Training	351	-	-	351
Seminars	-	257	12	269
Businesses programme	-	2 731	-	2 731
Special programmes a/	498	1 185	-	1 683
Total	4 555	8 979	466	14 000

a/ Operation Techo, Caja de Información y Autoayuda (Instruction and Self-Help Fund.)

/8. Productivity

8. Productivity services

The Technical Assistance Service's Chilean Productivity Institute was initiated in 1951, when the Chilean government approved a Basic Technical Assistance agreement with the United States government. Both governments agreed to exchange technical knowledge in order to assist Chile's development of her economic resources and production capacity.

In 1952, CORFO signed a Co-operative Technical Assistance agreement with the Institute of Inter-American Affairs which set up the Technical Assistance Service. In 1960, this became an autonomous organization associated with CORFO. Since then, it has received technical assistance from the United Nations, international organizations, and the governments of various countries. This assistance has been centred on professional training and other programmes.

The creation of this organization met the country's need for productivity promotion in all its economic activities.

Since its initiation, the Chilean Productivity Institute has accomplished important work in its field.

It has gone through three stages in its thirteen-year existence: experimental or demonstrative, direct and indirect technical assistance, and technical assistance to specific sectors.

(a) Experimental or demonstrative stage. During this period the Technical Assistance Service made its first contacts with large-scale industry and began its productivity studies. Important industries in various sectors were chosen as "pilot plants", and the Institute's technicians, advised by international experts, studied the problems of these industries and suggested solutions for them on the basis of modern concepts of rational administration.

The impact of these first efforts may be summed up as follows:

(i) Because the Service gave concrete results, some entrepreneurs realized for the first time this and the conviction was strengthened in others that productivity was a need of country-wide importance.

(ii) Many large-scale entrepreneurs were so impressed by the results of rational administration in various fields that they attempted to convince others of the need to apply these techniques.

/(iii) The

(iii) The Technical Assistance Service concerned itself with giving its technicians theoretical and practical training in rational administration. It used the collaboration of international experts, study grants in foreign universities, and pilot plants. The technicians gained experience through on-the-job training, as well. Several of them later opened their own consultation services.

(iv) Specialists of the Tecnincal Assistance Service were able to attest to the scarcity of technicians with knowledge of rational business administration.

The schools of Engineering, Economics and Business Administration in the various universities rarely included courses in this field, and those available were insufficiently developed to keep abreast with industrial technical progress. Specialists reported this anomaly to the administrations of the various schools, who realized that the universtities could not neglect this new trend and accepted the curriculum changes suggested by the Technical Assistance Service experts.

The Service's specialists not only supplied advice, but taught courses in administration in most of the universities.

Thus the schools of engineering, economics and business administration were the source of new technicians for the Technical Assistance Service and industry itself.

(b) Direct and indirect technical assistance stage. In this stage the Technical Assistance Service provided direct technical assistance to more than 400 Chilean enterprises in all economic sectors, in matters of rational administration such as general organization, production planning and control, plant and equipment layout, materials control, work methods and procedures, work and job evaluation, accounting and cost control, economic and financial analysis, etc.

A programme of indirect technical assistance was carried out through courses and seminars. These were designed to prepare enterprises personnel as realisation specialists and inform executives on various levels about administration methods.

/The Technical

The Technical Assistance Service worked on such a scale that its technical personnel were able to profit fully from its instruction in administrative methods, and most of those instructed became private consultants in rational business administration.

The new policy of technical assistance according to industrial branches (which led up to the sectoral approach) increased industry's demand for advisory services which gave increasing scope for the development of private consultants.

(c) Stage of technical assistance to specific sectors. The Technical Assistance Service is continuing its direct technical assistance, but on a smaller scale, leaving most of this work to private consultants.

In the two earlier stages, the Technical Assistance Service based its strategy for increasing productivity on the two traditional systems: increase of efficiency in individual enterprises by concentration on methods such as quality control, preventive maintenance, etc., and encouragement of industry as a whole to use these methods.

A third means, somewhere between the traditional ones, is the concentration on specific sectors. A complete branch of industrial activity, such as furniture or shoe manufacturing, is used as a basis for a thorough experiment in increasing its efficiency. By concentrating on a relatively small economic sector it is possible to use a wider range of methods and achieve a larger and deeper effect in the country's economy.

Each sector, in addition to development help on a government policy level, needs to use techniques which will increase productivity. This is the province of a Productivity Institute, which acts in the following areas: the design and installation of rational administrative systems and procedures (production planning and control, maintenance, personnel administration, etc.), new techniques for improving work methods, administrative operation demonstrations on all levels, productivity measurement of the sector to guide and control its development.

In order that the Institute and the sectors and sub-sectors may co-ordinate efficiently, productivity committees have been set up in each sector.

The Technical Assistance Service assigns specialists to their respective sectors in order to prepare studies aimed at increasing productivity.

In poorly-developed sectors recommendations of a general nature are put into practice by the Service's own technicians. More developed sectors contract their own technicians, who constitute the nucleus for a Productivity Centre for the sector.

Specific recommendations by the Productivity Committees are put into practice by special departments in the enterprises themselves and by private consultation services.

The Technical Assistance Service's sectoral action spreads ideas on productivity, encourages technician training, and supplies a new market for private consultation, all of which fulfil its basis objectives.

Productivity increase activities by sectors have dealt with construction, transport, textiles and wearing apparel, foreign trade, metallurgy, food industries, etc.

The construction sector provides an example of this sectoral activity.

Productivity committees have been formed for various construction activities (metal castings, masonry, ironwork, planning and control, municipal transactions, work methods) as parts of the Construction Productivity Commission which consists of members of the Chilean Chamber of Construction, the Chilean Institute of Rational Business Administration and the Techincal Assistance Service.

In order to demonstrate these productivity techniques, the Technical Assistance Service has supported the Construction Productivity Commission's project for building a nucleus of 230 houses with funds from CORVI, advised by the Productivity Committees and the Service's own staff.

(d) Economic resources. The Technical Assistance Service carries out its productivity development work with funds chiefly supplied by CORFO.

During the last two years, these funds totalled 24 million escudos (at 1965 valuation) and financed the Technical Assistance, Sectoral, Small-Scale Industry Assistance, and Adult Professional Training programmes.

/Agreements have

Agreements have been made with the United Nations [38] and various countries and international organizations [39] concerning equipment, experts and grants, totalling 5,571,296 dollars, for use in professional training programmes.

9. Direct governamental promotion through public or mixed enterprises

The governamental sector is involved in industry through state or mixed enterprises, generally in projects not of interest to the private sector for economic reasons (profit potential or the investment required); production of materials important to the country's economy which, due to market conditions, can only be set up as single lines of production; and those which open new fields of activity.

These industrial projects are designed to realize objectives such as the full use of natural resources. They must be effective in regional development, or play a socially important role, or be of basic importance in developing production of final consumption goods or lead to an economically sound industrial sector in the country, etc.

The government's participation in the financing of a particular project or of an enterprise varies according to its value and the interest shown by the private investor.

In general a government-initiated industry loses State support only when it proves to be of a non-essential character.

On the other hand the State takes over the operation of industries which are no longer of interest to the private sector, yet are necessary to regional or national economy.

Table 66 shows various industrial enterprises with government participation and in full operation.

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[38] United Nations Special Fund and ILO.

[39] France, Denmark, Belgium, England, International Bank for Reconstruction and Development (IBRD).

/Table 66

Table 66

CHILE: PRINCIPAL MANUFACTURING INDUSTRIES WITH GOVERNMENT PARTICIPATION

Name	Producting heading	Partnership capital (millions of dollars)	Percentage of government capitalization	Notes
Compañía de Acero del Pacífico (CAP)	Steel industry (rolled steel, tubing, industrial shapes)	67 979	23.9	Supplies about 90 per cent of Chilean production
Corporación de Radio de Chile (RCA Víctor)	Production and distribution of sound, television and cinema equipment	2 066	33.3	Other enterprises to be added as part of the national electronics programme
Impregnadora de Maderas S.A. (IMPREGMA)	Development of wood impregnation industry	629	97.5	First industry of its type. Supplies about 80 per cent of the market
Industria Azucarera Nacional S.A. (IANSA)	Beet-sugar	24 553	94.7	Produces 40 per cent of the country's sugar consumption. The rest is imported raw, and refined by private enterprises
Empresa Nacional de Petróleo (ENAP)	Oil deposits, refineries of petroleum derivatives and by-products	91 430	100.0	Owns all the country's oil deposits. Will participate in Chile's petrochemical industry
Empresa Pesquera Tarapacá S.A.	Development of combined fisheries industry (meal, oil tinned and frozen fish)	1 140	93.8	One of the first fisheries industries created by CORFO's fisheries plan

/Chapter VI

Chapter VI

OUTSIDE ASSISTENCE TO INDUSTRIAL DEVELOPMENT

1. Financial assistance

In the last 25 years (1940-1965), Chile has received various kinds of loans from abroad for her industrial development projects, from both the public and private sectors. These may be listed as follows:

(a) Eximbank

Has helped finance many industrial projects, such as the Compañía de Acero del Pacífico (CAP) (seven loans totalling 115 million dollars), MADECO, 2 rayon plants, wood, textile, metal-processing, fishing and other industries.

Eximbank's industrial loans total 140 million dollars. If electric power generation is considered an industrial activity, the total is 195 million.

(b) Inter-American Development Bank

Has given help to industry either by direct loans or loans granted through government organizations. Recipients of direct loans have included: ENAP; Tarapacá Fisheries; Pinihue Paper, Cardboard and Pressed Wood. Others have been supplied through the three loans received by CORFO which totalled 20 million dollars.

In all, the Inter-American Development Bank has loaned 56 million dollars to the industrial sector.

(c) Other international organizations

The International Bank for Reconstruction and Development and the International Finance Corporation have supplied loans to the public sector (CORFO, dairy and meat slaughtering and packing plants) and to the private sector (Pinihue Paper, Carozzi Noodles, Bío-Bío Cement), totalling 30 million dollars.

(d) Foreign private banks

Have contributed to financing of such projects as CAP, Polpaico Cement, fisheries. The industrial sector has received 11 million dollars, in addition to 7 million dollars loaned to Chilectra for electric power generation.

/(e) Foreign

(e) Foreign governments loans

Various governments have granted special credit lines through CORFO or the Banco Central, for the purpose of financing industrial projects in both the public and the private sectors. These include the governments of the German Federal Republic, England, Switzerland, Finland, Sweden, Norway, Denmark, Canada and Spain. Their loans total 50 million dollars.

2. Foreign private investment

In recent years, Chile has received most of the foreign capital investments in her industrial development under the provisions of Decree Law N° 258, known as the "Investor's Statute".

The distribution of these investments according to industrial activities is shown in table 67.

In addition to the mentioned Decree, there are other investment channels by which Chile's industry receives capital in foreign currency.

In 1961, the Ministry of Economic Affairs' Decree 1272 set up the mechanism through which the foreign investor can change his foreign currency to the Chilean equivalent for investment purposes, including industry. At the same time, he is guaranted the right to convert the profits of this investment back into foreign currency, in order to send them abroad. In addition, the Executive Committee of the Banco Central (through its 1963 circular N° 332) set up a procedure designed to favour investments of foreign capital which are to favour export industries.

However, most of foreign capital inflows enter under the provisions of Decree Law N° 258.

/Table 67

Table 67

CHILE: DISTRIBUTION OF FOREIGN INVESTMENT ACCORDING TO INDUSTRIAL HEADING IN 1954-1964

Industries	Number	Millions of dollars
Food industries	10	2.3
Beverages	1	0.0
Textiles	16	12.2
Footwear, clothing and other articles	1	0.2
Wood and cork	2	0.1
Paper and paper products	6	28.0
Printing and allied industries	2	0.1
Leather and leather products, except footwear	7	0.9
Rubber products	3	0.9
Chemical substance and products	30	9.9
Petroleum and coal products	3	0.8
Non-metallic minerals (except petroleum and coal)	13	3.6
Basic metals	5	2.0
Factories for metal products, except Machinery and transport equipment	9	2.2
Machinery, except electrical machinery	5	1.8
Electrical machinery, accesories and articles	1	0.1
Transport materials	6	2.8
Miscellaneans manufactures	4	0.4
Construction	3	0.9
Transport	9	0.4
Warehousing	1	0.5
Communications	1	0.1
Services	4	1.2
Total	205	241.6

/3. Technical

3. Technical assistance

Among the multilateral technical assistance programmes in operation in 1965 are the following:

(a) Projects of the United Nations Expanded Technical Assistance Programme

Number of Experts	Project	Number of months during 1965
1	Financing and market problems of small-scale industry (Technical Assistance Service) (SCT)	12
1	Maintenance of machinery and equipment in small-scale industry (SCT)	12
2	Technology of steel industry	3 months each

A 10,000 dollar marketing study for the small-scale leather industry with a view to exportation to the United States.

(b) Projects of the United Nations International Labour Organisation

Number of Experts	Project	Number of months during 1965
2	Training in metallurgic industry (SCT)	4 months each
1	Industrial Productivity (SCT and CORFO)	
1	Formation of co-operatives	7

(c) Projects of the United Nations Special Fund

Through an agreement between the Internationstional Labour Organisation (ILO) and the Chilean government agency, The Technical Assistance Service (SCT), the United Nations Special Fund (with a contribution of 1,120,000 dollars) and the Chilean government (421,000 dollars) undertook the financing of a training centre in Santiago. This is to prepare instructors, supervisors and foremen for the following trades, both in the public and private industrial sectors: Technical design, agricultural machinery, electricity, welding, carpentry, metallurgy, lathe operation diesel motor vehicle mechanics. The necessary equipment is valued at 300,000 dollars.

/(d) Projects

(d) Projects of the Inter-American Development Bank

Project	User	Date of Approval	Amount approved (dollars)	Amount spent until February 1965 (dollars)
Fisheries development	CORFO	4.9.61	6 000 000	5 655 902
Financing of fisheries enterprises	CORFO	12.7.61	4 750 000	4 530 294
Financing of pulp industry expansion	Compañía Manufacturera de Papeles y Cartones (private)	11.8.62	16 000 000	12 090 904
Financing of a saw mill	Maderas Aglomeradas Pinihue (CORFO)	2.7.63	1 235 000	1 027 937
Development of enterprises in industry, mining, fishery, lumber and small-scale industry	CORFO	3.12.64	6 000 000	2 484 137
Financing of expansion of the pulp plant at Laja	Compañía Manufacturera de Papeles y Cartones (private)	10.8.64	1 400 000	-

/(e) Projects

e) Projects of the Inter-Governmental Committee for European Migration

Fishing masters brought over in 1963 for the fisheries industry.

15,000 dollars. Tractor repair workshop in San Felipe. Two Belgians.

15,000 dollars. Tractor repair workshop in Chillán.

15,000 dollars. Five plumbing workshops in Santiago, Valparaíso and Concepción. Five Spaniards.

Technical assistance to be provided during 1966 and 1967 by the United Nations Special Fund:

	3 000 dollars in equipment
	216 000 dollars in experts
	29 000 dollars in grants
Total	258 000

Finally, among the bilateral technical assitance projects in the industrial sector are the following:

Country	Project	Contribution in dollars	Year
Belgium	Labour Promotion Institute	180 000	1965
Belgium	Technical Assistance Service (SCT) Copiapó	110 000	1965
England	Technical Assistance Service Equipment	42 000	1965
France	Technical Assistance Service Equipment	115 000	1965
United States	Co-operative Financing Institute	1 650 000	1965
United States	Labour Promotion Institute	523 000	1961-66
Denmark	Technical Assistance Service Equipment	100 000	1965

Country	Number of experts	Project	Number of months at work	Year
Denmark	2	MAIPU METALLURGIC CENTRE		August 1965
Holland	1	Pulp industry		
Sweden	1	Industrial marketing of meat	3	1964
France		Technical Assistance Service (SCT) 30 000 dollars		
Denmark		Technical Assistance Service (SCT) 3 000 dollars		

Country	Number of grants	Project	Months
Germany	8	Engineering specialists and technicians	9
Holland	1	Small-scale industry	